

PC

**MS-DOS 3.30
User's Guide**

**Worldwide
Information
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MS-DOS 3.30 USER'S GUIDE

SUBJECT

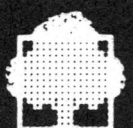
User's Guide for MS-DOS 3.30

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LEARNING ABOUT MS-DOS

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Summary	In this section you learn about important MS-DOS terms, and your Personal Computer (PC) keyboard.
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TERMS AND CONCEPTS YOU SHOULD KNOW

The following pages explain some terms you need to know so that you can read and use this manual. If you are already familiar with MS-DOS, you may find later sections more useful.

Program

Programs, often called application programs, applications, or software, are series of instructions written in computer languages. These instructions are stored in files and tell your PC to perform a task. For example, a program might tell your PC to alphabetically sort a list of names. Spreadsheets and word processors are other examples of programs.

File

A file is a collection of related information, like the contents of a file folder in a desk drawer. File folders might contain business letters, office memos, or monthly sales data. For example, your MS-DOS master diskette contains more than 30 files. Your other diskettes may contain files that you have created, or that came with the diskette.

File Name

Just as each folder in a file cabinet has a label, each file on a disk has a name. This name has two parts: a file name and an extension. A file name can be from one to eight characters in length, and can be typed in uppercase or lowercase letters. MS-DOS automatically converts file names to uppercase letters.

File name extensions consist of a period followed by one, two, or three characters. Extensions are optional, but it's a good idea to use them, since they are useful for describing the contents of a file to you and to MS-DOS. For instance, to quickly identify your report files, you can add the file name extension .RPT to each one. Here's an example of a file name with this extension:

PROGRESS.RPT
|
file name *file name extension*

When you look at the directory on your MS-DOS master diskette, you will see many files with the extension .EXE or .COM. The extension .EXE means executable, and .COM means command. These extensions tell MS-DOS that the files are programs that can be run. Many files have other kinds of extensions, such as .DOC and .TXT, which might contain text. Another common program file extension is .BAS for BASIC programs. Some application programs automatically assign file name extensions. For example, *Microsoft Multiplan(R)* assigns the extension .MP, and *Lotus 1-2-3* assigns one of three extensions, for instance .WKS for worksheet files.

Directory

A directory is a table of contents for a diskette. It contains the names of your files, their sizes, and the dates they were last modified.

Volume Label

You can put a label on the outside of a new diskette to help you identify its contents. You can also give each of your diskettes an internal name, called a volume label.

You can look at the volume label on a disk by displaying its directory. Some programs may look at the volume label to see if you are using the correct disk. So make sure that you label your disks. Refer to Section 4 for step-by-step instructions on how to create a volume label for a disk.

Disk Drive

To use the files or programs that are on a diskette, you must first insert the diskette into a disk drive. Diskette drives are commonly referred to as the A drive and the B drive. A hard disk drive, normally installed inside your PC, is usually referred to as the C drive. Check your PC manual to see which drive is A and which is B (or C).

Drive Name

A complete drive name consists of a drive letter and a colon. When using a command, you may need to type a drive name before your file name to tell MS-DOS where to find the disk that contains your file. For example, suppose you have a file named FINANCES.DOC on the diskette in drive B. To tell MS-DOS where to find this file, type the drive name before the file name:

B:FINANCES.DOC
drive name file name with extension

The Default Drive and the MS-DOS Prompt

If you do not specify a drive name when you type a file name, MS-DOS automatically searches for the file on the disk in the default drive. The default drive is where MS-DOS searches first when you type a command. To let you know that it is ready to receive a command, MS-DOS displays a symbol, called a prompt, that contains the default drive letter followed by a greater-than sign (>). Following the greater-than sign is the cursor, the blinking box or flashing underline that shows where the next character you type appears. Here is an example of a typical MS-DOS prompt and the cursor:

A>
MS-DOS prompt cursor

When your prompt is A, MS-DOS searches only the diskette in drive A (the default drive) for files and programs, unless you tell it to search in another drive.

Changing the Default Drive

To change the default drive, type the letter of the desired drive, followed by a colon. For example, if you are working primarily with files on drive B, it is easier to change the default drive to B, so that you do not have to type the letter B, followed by a colon, with every command and file name. To change the default drive to drive B, type:

B:

Command

Just as you run programs to create and update files containing your data, you also need to run some special programs, called MS-DOS commands, that let you work with entire files.

When you type MS-DOS commands, you are asking your PC to perform tasks. For example, when you use the DISKCOPY command to copy your MS-DOS master diskette, you are using a file named DISKCOPY.COM, whose task is to copy the files on the MS-DOS diskette.

Other MS-DOS commands

- Compare, copy, display, delete, and rename files
- Copy, format, and label disks
- Run your programs, as well as those supplied by MS-DOS
- List directories for disks
- Set the date and time
- Set printer and screen options.

You learn more about MS-DOS commands in Section 4.

Devices

When you use your PC, you supply the information (input) and expect a result (output). Your PC uses pieces of hardware called devices to receive input and send output.

For example, when you type a command, your PC receives input from your keyboard and disk drive, and usually sends output to your screen. It can also receive input from a mouse, or send output to a printer. Some devices, such as disk drives, perform both input and output.

Device Names

Device names are special names given to each device that your PC "knows" about. An example of a device name is LPT1, which stands for the first parallel line printer connected to your PC.

When you add a new device, such as a mouse, to your PC, you sometimes need to tell MS-DOS about it by setting up (configuring) your PC for that device. Refer to the information that came with your device, or to Appendix B of this manual, for more information on configuring your PC for devices.

Error Messages

If you or your PC makes a mistake when using a device or MS-DOS command, MS-DOS displays an appropriate error message. Error messages apply to general errors (such as misspelling a command) or to device errors (such as trying to use a printer that is out of paper). For a complete list and explanation of each MS-DOS error message (device and general), refer to Appendix G in the *MS-DOS Reference Manual* (Order No. HU95).

Memory

Memory is the place in your PC where information is actively used. When you run a program, MS-DOS stores that program and the files it uses in the PC's available memory. Some programs and files use more memory than others, depending on how large and complex they are.

KEYS FREQUENTLY USED WITH MS-DOS

Now that you have learned about MS-DOS terms, you can learn about the keys you use with MS-DOS. In addition to the keys you would find on a typewriter, your PC keyboard has some keys that have special meanings to MS-DOS.

Differences Between Keys

First, note that there are two important differences between a typewriter keyboard and a PC keyboard:

A PC understands the difference between a one and a lowercase L. Be sure you do not type a lowercase L when you mean a one.

Capital O and zero may look alike, but they have different meanings to a PC. Many PCs display a zero with a diagonal line through it. Make sure you type the correct letter or number when you give commands to MS-DOS.

The Enter Key

Press the Enter key after you type commands. When you press the Enter key after typing a command, MS-DOS performs the command.

Keys that Move the Cursor

The space bar moves the cursor to the right.

Use the Backspace key to correct typing mistakes on the current line. The Backspace key deletes characters as it moves the cursor to the left.

To move the cursor to the left or right without deleting any characters, use the direction keys. Direction keys move the cursor right, left, up, and down. They do not affect the characters that are displayed. Some programs ignore these keys or do not use them. In this manual, the direction keys are also referred to as the Right, Left, Up and Down arrow keys.

Control Key Combinations

The Control (or Ctrl) key has a special task. It lets you give complex commands to your PC by pressing only two or three keys. You hold down the Control key while you press another key. That is, you use the Control key as you would the Shift key.

When you press the Control key and the S key at the same time, you can stop the scrolling of the screen display. To continue scrolling, press any other key.

When you press the Control key and the Num-Lock key at the same time (on the enhanced keyboard), you can stop the screen (Pause Screen). This is helpful when information is appearing on the screen too fast to read.

When you press the Control key and the Break key at the same time, you can stop a command key from finishing.

When you press the Control key and the PrtSc key at the same time, you can print one line at a time as it appears on the screen (Printer Echo).

If you want to restart MS-DOS (System Reset), press the Control, Alt, and Delete (Del) keys at the same time.

Section 2

LEARNING ABOUT DISKS, FILES, AND DIRECTORIES

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Summary In this section you learn about 5-1/4 inch flexible diskettes, 3-1/2 inch flexible diskettes, hard disks, file names, and directories.

5-1/4 INCH FLEXIBLE DISKETTES

A 5-1/4 inch flexible diskette is a flexible, magnetized plastic diskette approximately 5-1/4 inches in diameter. A double-density flexible diskette can store up to 400 single-spaced pages of text. A high-density diskette can store about three times that amount. Every flexible diskette is enclosed in its own protective cover. The front of this cover is smooth, while the back has visible seams. You should always place labels on the front of the cover, at the top, so that the label does not touch the magnetic surface of the diskette. Use a felt-tip pen when writing on labels (a pencil or ballpoint pen can damage the disk if you press too hard).

You should store flexible diskettes in a safe place, away from dust, moisture, magnetism, and extreme temperatures. Be sure to label each diskette you use, since labels help you identify the files on the diskette and remind you that the diskette has information stored on it.

Write Protection for 5-1/4 Inch Diskettes

Labels help you keep track of the information on your diskettes, but you may also need to protect the information on the diskettes themselves. Some flexible diskettes are protected, letting you examine information on them without letting you change anything. These are called write-protected diskettes.

Flexible diskettes can be write-protected in one of two ways. Some have a small piece of tape, called a tab, covering a notch on the right side of the diskette. You can copy information onto a write-protected diskette by removing the write-protect tab. However, you should consider why the diskette was protected before you change its contents. After you have copied or changed a write-protected diskette, replace the write-protect tab.

If a diskette does not have a write-protect notch, it is permanently write-protected. Many application programs, including this version of MS-DOS, come on write-protected diskettes that protect the files from being accidentally destroyed.

3-1/2 Inch Diskettes

The MS-DOS 3.3 operating system also supports 3-1/2 inch diskettes, which, like 5-1/4 inch diskettes, are portable magnetic disks. Data on 3-1/2 inch diskettes is more densely packed. Depending on the style, a single 3-1/2 inch diskette can store as much (or more) data as a high-density flexible diskette.

These smaller diskettes, sometimes called microdiskettes, have rigid plastic covers with metal shields that guard the diskette from dirt and fingerprints. When you place the diskette into the disk drive, your PC automatically moves this shield aside to read the diskette.

Write Protection for 3-1/2 Inch Diskettes

Note that 3-1/2 inch diskettes have a write-protect notch. This notch can be covered with a built-in tab. If the notch is uncovered, the diskette is write-protected, and no data can be written to the diskette.

Be sure to label your 3-1/2 inch diskettes and store them in a safe place. As with 5-1/4 inch flexible diskettes, extreme temperatures, magnetism, dust, and fingerprints can all harm the data on a diskette.

NOTE: MS-DOS works virtually the same way with both 3-1/2 inch and 5-1/4 inch diskettes. In this documentation, the term flexible diskette is used to mean either of these two types of diskettes.

HARD DISKS

In addition to flexible diskettes (with removable media), some PCs use a hard (or fixed) disk, which can store much more information than a flexible diskette. PCs also take less time to find information stored on a hard disk than on a flexible diskette. A hard disk is usually built into the PC, and the magnetic media is "fixed" or nonremovable.

When you store application programs, including MS-DOS, on your hard diskette, you should keep a backup copy of the programs on a flexible diskette in case the information on the hard disk is accidentally damaged or destroyed. (For more information about making a backup copy of your MS-DOS diskette, refer to Section 3.)

FORMATTING YOUR DISKS

Before you can use your new disk(ette)s for storing information, you must format them. You do this with the FORMAT command, a special program that structures a disk so that MS-DOS can find information on it. The FORMAT command also check the disk for defective spots.

You can format both flexible diskettes and hard disks. But remember that if a disk is not blank, formatting it destroys many data already on the disk.

You learn more about the FORMAT command in Section 4.

NAMING YOUR FILES

When naming a file, you may have trouble finding a name that uniquely identifies the file's contents. Dates, for example, are often used in file names; however, they take up several characters, leaving you with little flexibility. Other common names for files are words like budget, finances, analysis, report, etc. These kinds of file names identify the contents, but leave little room for dates. The secret is to find a compromise, a point where you can combine a date with a word, creating a unique file name.

The name of a typical MS-DOS file (refer to Section 1) looks like this:

customer.lst

Notice that the file name was typed in lowercase letters. You can type file names in uppercase or lowercase letters, and MS-DOS converts them into uppercase letters. Some examples of file names are:

BUDGET.86
TAKEOVER.BID
JUNE86
FINANCES.DOC
SCHEDULE.MAY

Valid File Name Characters

Many of your file names contain only letters and numbers. But you may also use any of the following symbols (and letters) in your file names and extensions:

A-Z a-z 0-9 \$ % ' - @ ~ ` ! # () &

WARNING

Some applications may not let you use all of these symbols. If in doubt use only letters and numbers.

Invalid File Names

Although you have some freedom when naming your files, there are certain names that you may not use, because MS-DOS reserves them for specific devices that your PC uses. These invalid names are AUX, CLOCK\$, COM, CON, LPT, LST, NUL, and PRN. You can use these names as extensions (except for CLOCK\$), but remember not to use them to name you files.

DIRECTORIES

The names of your files are kept in a directory on each disk. The directory also contains information on the sizes of the files, and the dates they were created and updated.

To display a list of the files on your disk, use the DIR command. This command tells MS-DOS to display all the files in a specific directory on a disk. For example, a directory of the diskette in drive A might look like this:

Volume in drive A is DOS FILES				
Directory of A:\				
COMMAND	COM	23612	7-15-87	12:00p
ANSI	SYS	1651	7-15-87	12:00p
ATTRIB	EXE	8234	7-15-87	12:00p
BACKUP	COM	22906	7-15-87	12:00p
CHKDSK	COM	9680	7-15-87	12:00p
FORMAT	COM	3936	7-15-87	12:00p
EDLIN	COM	7356	7-15-87	12:00p
7 File(s)		282620 bytes free		

NOTE: The file sizes and dates you see on your screen may, of course, differ from the ones shown here.

You can also get information about any file on your disk by typing the DIR command followed by a file name. For example, to display directory information for a file named schedule, you would use the following command:

```
DIR SCHEDULE
```

MS-DOS would respond by displaying the file name schedule, followed by the file's size in bytes and the date and time it was last changed; for example,

```
SCHEDULE.TXT  3698  8-7-87   4:11pm
```

NOTE: Should there be other files in the same directory with the same name but with a different extension (such as SCHEDULE.DAT), these files would also be listed.

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Summary	In this section you learn how to start and exit MS-DOS, how to make a backup copy of your MS-DOS disk(s), what to do if you only have one flexible diskette, and how to install MS-DOS on a hard disk.
---------	--

HOW TO START MS-DOS

Starting MS-DOS From a Flexible Diskette

To start, or "boot," MS-DOS from a flexible diskette, follow these steps:

1. Make sure your PC is turned off.
2. Take the MS-DOS master diskette out of its protective jacket.
3. Insert this diskette into drive A. (Refer to your PC Owner's manual for the correct drive and diskette insertion procedure).
4. Close the disk drive door (if applicable).
5. Turn on the power for your monitor and your PC.

The light on the disk drive should glow, and you should hear some whirring noises as your PC "reads" the diskette. After the PC has completed some internal hardware tests, the MS-DOS copyright message appears on the screen. You should then see the following date and time prompt on your screen:

```
Current date is Tue 1-01-1980
Enter new date (mm-dd-yy):
```

MS-DOS asks you to provide the date. Refer to "Setting the Date and Time" in this section for instructions, or press the Enter key to bypass these prompts.

Starting MS-DOS From a Hard Disk

NOTE: This procedure assumes that DOS has been installed on the hard disk drive. If DOS has not been installed on the hard disk, refer to "MS-DOS Installation on a Hard Disk" later in this section.

1. Make sure that drive A is not engaged (diskette removed or drive door not closed).
2. Turn on power to the PC and monitor.

The PC should now perform the self-tests and load MS-DOS into memory, as described in "Starting MS-DOS From a Flexible Diskette."

Setting the Date and Time

If MS-DOS prompts you for the date and time, enter these as described below.

NOTE: If your system disk (flexible diskette or hard disk) contains an AUTOEXEC.BAT file, MS-DOS does not prompt you for the date and time unless the DATE and TIME commands are included in the AUTOEXEC.BAT file. For more information on the AUTOEXEC.BAT file, refer to Section 8 of this manual.

1. Type the date. For example, if the date is July 6, 1988, type the following command, then press the Enter key.

07-06-88

If the date is already correct, or you do not want to answer this prompt, press the Enter key to move to the next step.

2. Type the time according to a 24-hour clock. For example, if it is 1:30 p.m., type the following, then press the Enter key:

13:30

If the time is already correct, or you do not want to answer this prompt, press the Enter key.

MS-DOS does not accept your command until you press the Enter key.

Your screen should appear similar to the following:

```
Current date is Tue 1-01-1980
Enter new date (mm-dd-yy): 07-06-88
Current time is 0:00:45:10
Enter new time: 13:30
Microsoft(R)  MS-DOS(R)  Version 3.30
(c)Copyright Microsoft Corp 1981-1987
A>_
```

In this example, the default drive is drive A, so A> is the standard MS-DOS prompt. When you see the DOS prompt, MS-DOS is waiting for instructions from you.

HOW TO EXIT MS-DOS

You can end your MS-DOS session by following these steps:

1. Make sure that your last command is finished. You should see the MS-DOS prompt (for example, A>) on the screen.
2. Remove the diskettes from the drives, put them back in their protective jackets, and store them in a safe place, away from dust, moisture, and magnetism.
3. Turn off your PC.
4. Turn off your monitor.

MAKING A BACKUP COPY OF YOUR MS-DOS DISKETTES

MS-DOS comes with a program named DISKCOPY that lets you copy the contents of disks. You need not format blank disks before you use the DISKCOPY command.

To make a backup copy of your MS-DOS master diskette:

- 1. Start MS-DOS with the MS-DOS master diskette in drive A.
- 2. Make sure that you have blank diskettes available to make copies of each of the DOS master diskettes. The volume labels (recorded on disk) and external labels for each type of diskette are as follows:

Volume Label	External Label	Media
DOS330S1310	Drivers	5-1/4, 360 KB
DOS330S2310	DOS	5-1/4, 360 KB
DOS330S3310	Options	5-1/4, 360 KB
DOS330S1220	DOS/Drivers	3-1/2, 720 KB
DOS330S2220	Options	3-1/2, 720 KB
DOS330S1120	DOS/Drivers/ Options	3-1/2, 1.44 MB

- 3. At the MS-DOS prompt, type the following:

DISKCOPY A: A:

4. Press the Enter key. If you make a mistake when typing this command, such as misspelling it, MS-DOS displays the following error message:

```
Bad command or file name
A>_
```

To fix this error, retype the command, and check the spelling before you press the Enter key.

Your screen should look like this:

```
A>diskcopy a: a:

Insert SOURCE diskette in drive A:

Press any key when ready...
```

5. Press any key to start the DISKCOPY program. After MS-DOS has read the source diskette, the following prompt appears:

```
Insert TARGET diskette in drive A:

Press any key when ready...
```

Remove the MS-DOS master diskette, put the blank diskette into the drive, and press any key. You may need to reinsert the SOURCE and TARGET diskettes several times to complete the copy process.

When the DISKCOPY program is complete, the following prompt is displayed:

```
Copy another? (Y/N)
```

6. Type N (for No) to end the diskcopy program if you have copied all the master diskettes. Type Y (for Yes) if you want to copy another master diskette.

You now have copies of the master MS-DOS diskettes. Use these copies for everyday use.

Write-protect the new copies, following the procedure discussed in Section 2. Then put your MS-DOS master diskette(s) in a safe place, away from dust, moisture, and magnetism. If anything should happen to the copies you have just made, you use the master diskettes to make another copy.

NOTE: Always use your backup copy of the MS-DOS master diskette(s). Keep the master diskette(s) in a safe place.

MS-DOS INSTALLATION ON A HARD DISK

Using DOSINS

If you have a hard disk on your PC, you will probably want to install MS-DOS on your hard disk. This allows you to "boot" your PC from the hard disk.

MS-DOS is packaged with a special software utility called DOSINS. This utility assists you in installing MS-DOS onto a hard disk for the first time, or assists you in upgrading your hard disk from a previous version of MS-DOS.

However, there are certain situations that prevent the use of DOSINS. Read the warning below and then follow the instructions applicable to your system.

WARNING

If your hard disk has more than one partition that was created and formatted using XFDISK and XFORMAT (used with some previous MS-DOS versions to create multiple partitions on a hard disk larger than 32 MB), you cannot use DOSINS to upgrade your hard disk to MS-DOS 3.3. You must use the appropriate manual upgrade procedure found later in this section.

Also, if you are upgrading from a previous version of MS-DOS and your PC has a streaming tape drive, you may want to use the manual upgrade procedure to take advantage of your tape drive's backup capabilities. If you are upgrading using DOSINS and a backup of your hard disk is required, DOSINS requires the use of flexible diskettes.

Automatically Installing MS-DOS on a Hard Disk

Follow the instructions below to install MS-DOS on your hard disk using DOSINS.

You need all the diskettes that you received to install MS-DOS. If you received 5-1/4 inch diskettes, you need the copies of the three diskettes labeled DRIVERS, DOS, and OPTIONS. If you received 3-1/2 inch 720 KB diskettes, you need the copies of the two diskettes labeled DOS/DRIVERS and OPTIONS. If you received 3-1/2 inch 1.44 MB diskettes, you need the one diskette labeled DOS/DRIVERS/OPTIONS.

Use only the copies of your master diskettes for the installation. Store your originals in a secure place. If you have not yet made a backup copy of your MS-DOS diskettes, refer to "Making a Backup Copy of Your MS-DOS Diskettes," earlier in this section.

NOTE: The volume labels are important. These should be recorded on your backup diskettes.

You may choose to install an international keyboard and country code during the installation procedure. (This is necessary only if your keyboard uses international symbols.) Refer to Appendix D for the available options. The default installation is a United States keyboard.

DOSINS leads you through the installation with menu selections that are self-explanatory. If you find a selection confusing, refer to the explanation for that menu in this section. If you make a mistake, you can start the installation over. However, if you have to do this, it is wise to make a new backup copy of your master diskettes since temporary data is written to the installation MS-DOS diskette.

You are prompted to change diskettes several times. Read the prompt and insert the proper diskette. If you insert the wrong diskette, the prompt reappears until you insert the correct diskette.

Installing, Starting, and Exiting MS-DOS

Step 1 Remove the write protect tab.

Remove the write protect tab from the diskette labeled DOS (or DOS/DRIVERS in the case of 3-1/2 inch 720 KB diskettes, or DOS/DRIVERS/OPTIONS in the case of 3-1/2 inch 1.44 MB diskettes) if a write-protect tab is present.

Step 2 Load the system.

Insert the diskette labeled DOS in drive A and power on the system. Enter the date and time.

Step 3 Execute DOSINS.

Install MS-DOS using the installation utility, DOSINS. When the system prompt A> is displayed, type:

DOSINS

and press the Enter key. The program leads you through the installation process.

WARNING

Heed all warning messages if your hard disk already contains data. Some configurations prohibit the use of this installation utility.

The first screen looks like this:

***** WARNING *****

BEFORE CONTINUING WITH THIS INSTALLATION BE SURE
YOU ARE USING COPIES OF THE MASTER DISKETTES.

STORE THE MASTER DISKETTES IN A SAFE PLACE.

FOLLOW THE INSTRUCTIONS IN THE USER MANUAL TO
CREATE COPIES

Press any key to continue.

Two other messages follow:

***** DOSINS *****

This procedure will install DOS 3.3 on your
fixed (hard) disk

Press any key to continue

and

To install DOS 3.30 you MUST HAVE [1, 2 or 3]
DOS 3.30 DISKETTES

Press any key to continue

DOSINS then checks your hard disk. If it is a new
disk that has not been prepared for MS-DOS, you are
led through a disk initialization procedure.

If your disk currently has data on it, or has been
set up to receive data, the following screen is
displayed.

HARD DISK SETUP MENU

Available Selections

- | | | |
|---|----------------------|---|
| 1 | Initialize Hard Disk | setup your hard disk
which will destroy any
data presently on the
disk |
| 2 | Upgrade Hard Disk | upgrade your hard disk
to DOS 3.30 from a
previous DOS version,
preserving the data
presently on the disk
NOTE DOSINS will
terminate if your disk
does not contain a
valid DOS format |

ESC Exit Hard Disk Setup exit this procedure

Press selection number and

Installing, Starting, and Exiting MS-DOS

If you are a new user and/or if you do not want to preserve data on your disk, choose "Initialize Hard Disk."

If you have valid MS-DOS data on your disk and you want to preserve it, select "Upgrade Hard Disk." If your disk does not contain valid MS-DOS data (MS-DOS format), choosing the upgrade option causes the installation procedure to abort. If this should happen, you must manually save any data on your hard disk, restart the installation procedure by entering DOSINS, and choose the initialize option.

If you have data on your disk and you choose to upgrade, the type of existing data is determined. If the disk is in a format compatible with MS-DOS 3.30, all MS-DOS 3.30 files are copied to your disk with no further disk preparation required (except for specifying the subdirectory where you want the MS-DOS commands copied).

If the existing format is not compatible, you are led through a backup procedure to save your existing data.

You must know the type of media you are using for backup. Your options are:

3-1/2 inch drives:	720 KB (double density) 1.44 MB (high density)
5-1/4 inch drives:	360 KB (double density) 1.2 MB (high density)

The remainder of the disk preparation is the same as for initializing a disk.

When you initialize your system, you must set up your disk to receive data. This is performed by two commands FDISK and FORMAT. FDISK is further explained in step 1 of "Installing MS-DOS on a New Hard Disk System." New users should accept the default values in the installation procedure. If your hard disk has already been set up, follow the procedure described below.

When FDISK is executed by the installation procedure, select the option to "Delete DOS partition." Then select the option to "Create DOS partition." If you create a partition smaller than the entire disk, you must also select the menu option to "Change Active Partition." *It is very important that you follow these steps.*

The procedure then formats the "partition" created above by FDISK. FORMAT asks if you are sure you want your disk formatted, since the format procedure destroys any existing data. Answer yes (Y) to this prompt.

You are also prompted to provide a name for the subdirectory where you want your MS-DOS commands to reside. If you do not understand what a subdirectory is, press the Enter key and a default directory, dosdir, will be created for the DOS files. The subdirectory you specify is created by DOSINS if it does not already exist. It is not a good idea to keep MS-DOS commands or data files in the root directory since you are limited in the number of entries that may reside there.

After all MS-DOS files are copied, you are asked if you want to restore any files backed up by DOSINS's backup procedure. Answer no to this prompt unless you are upgrading from an earlier noncompatible MS-DOS format and have just created backup diskettes during this installation procedure.

If you created backup diskettes, you were instructed to number them 01, 02, etc. Make sure you restore these diskettes in the proper order. Use only the diskettes you just created as part of this installation procedure.

The installation procedure then asks if you want an international installation. For U.S. users, answer N. For international users, enter Y and then select the appropriate country from the menu. If your country is not on the first menu, press Esc to display the next menu. Esc toggles between the two menus. Select the option you want, and press Enter.

For the system to become active, you must now restart the system. Remove the diskette from drive A when the MS-DOS prompt appears. Press any key to start the system.

Manually Installing MS-DOS on a New Hard Disk System

This section describes the installation procedure for manually installing MS-DOS on a new hard disk. You should use the working copies of the master MS-DOS diskettes that you have already created. (If you have not made working copies of the master MS-DOS diskettes, you should do so now. Refer to the instructions in this section for your hardware configuration.)

If you already have a previous version of MS-DOS installed on your hard disk, refer to the appropriate heading in this section for information on how to replace the previous version with the new one.

Note that each instruction is first given in summary form for the experienced user, followed by detailed instructions for those who need them.

The installation procedure consists of two steps.

Step 1

Create a DOS partition on the hard disk.

In DOS, you must define a hard disk using the FDISK command. If you want DOS to share a hard disk with one or more operating systems, you must allocate portions of the disk storage space to each operating system. These allocated areas are called partitions. A maximum of four primary partitions are possible on the hard disk. For more information on configuring your hard disk, refer to Appendix C in this manual.

Insert the DOS diskette in drive A and power-up the system. Enter the date and time. When the system prompt A> is displayed, type

FDISK

and press the Enter key.

The FDISK menu is displayed:

Fixed Disk Setup Program

FDISK Options

Current Fixed Disk Drive: 1

Choose One of the Following:

1. Create DOS Partition
2. Change Active Partition
3. Delete DOS Partition
4. Display Partition Information

Enter choice: [1]

Press ESC to return to DOS .. []

Type 1 and press Enter to create your DOS partition. The following screen appears:

Create DOS Partition

Current Fixed Disk Drive: 1

1. Create Primary DOS Partition
2. Create Extended DOS Partition

Enter choice: [1]

Press ESC to return to FDISK Options

Type 1 and press Enter to create your primary MS-DOS partition. The following screen appears:

Create Primary DOS Partition

Current Fixed Disk Drive: 1

Do you want to use the maximum size

for a DOS partition and make the

DOS partition active (Y/N).....? [Y]

Press ESC to return to FDISK Options

If you intend to use MS-DOS as your only operating system enter Y, or press Enter. Your entire hard disk is dedicated to MS-DOS. With the MS-DOS diskette in drive A, press any key. The system is automatically restarted. Enter the date and time. Continue the installation procedure at step 2.

If you want to use more than one operating system, enter an N, and press Enter. The following screen appears:

Total hard disk space is nnn cylinders

Maximum available space is nnn

Cylinders at nnn

This screen shows the total number of cylinders available on your hard disk. Press Enter, and the following prompt appears:

ENTER PARTITION SIZE

Enter the partition size (in cylinders). The minimum practical size is 10 (roughly the size of a flexible diskette). You can leave this blank and MS-DOS defaults to the largest amount of cylinders allowable.

When you press Enter the screen changes to show your new hard disk partition statistics, and the prompt:

Press Esc to return to FDISK Options. []

Select option 2 from the menu to make the MS-DOS partition active. A screen similar to the following appears:

```
Hard Disk Setup Program

Change Active Partition

Current Hard Disk Drive: 1

Partition  Status  Type  Start  End  Size
1           N      DOS   000    xxx   xx

Total disk space is xxx cylinders

Enter the number of the partition you
want to make active ..... [ ]

Press Esc to return to FDISK Options [ ]
```

Enter 1 to make the first partition. Press the Esc key to return to the FDISK options menu. Press it again to restart the operating system from the diskette in drive A.

Step 2

Load country codes, format disk, copy MS-DOS.

After partitioning the hard disk, you must use the SELECT command to tell MS-DOS your country and keyboard codes, format your MS-DOS partition, and copy the MS-DOS files to your hard disk.

WARNING

FORMAT destroys anything that is on your MS-DOS partition. If you have any data on the partition, refer to the appropriate instructions for upgrading the hard disk from a previous MS-DOS version.

Choose your country and keyboard codes from the table in Appendix D. Make sure that the DRIVERS diskette is in drive A. Type

```
SELECT C: xxx yy
```

where xxx is the country code and yy is the keyboard code you chose from the table. A message appears warning you that SELECT erases everything on the disk and asking you if you want to continue. To proceed with formatting, type Y and press Enter.

Formatting a hard disk takes a few minutes. A message appears as the disk is being formatted indicating the head and cylinder numbers. They keep changing as the formatting progresses.

Upon completion, you are asked to enter a volume label. You can enter any unique name or number consisting of up to 11 characters by which you want to identify the hard disk, and press Enter. If no volume label is desired, press the Enter key.

As the files from the DRIVERS diskette are read into memory the message "Reading source file(s)..." is displayed. The names of the files appear on the screen as they are copied to your hard disk. When the files have been copied, the A> prompt is displayed.

The SELECT procedure is complete, and you have successfully installed MS-DOS.

Use the COPY command to transfer the files on the remaining diskettes to the MS-DOS partition on the hard disk. Insert the next diskette to be copied in drive A and type

```
COPY A:*. * C:
```

and press Enter. The files on the MS-DOS diskette are copied to the hard disk. Each file name is listed on the screen as it is copied. When finished, the number of files copied and the prompt are displayed. Repeat this copy command for each remaining diskette.

You have now installed the operating system software on the hard disk. The next time you load the system, you can boot from drive C.

Upgrading the Hard Disk From MS-DOS 3.x to MS-DOS 3.3

If you already have an earlier version (3.x) of MS-DOS on the hard disk and want to upgrade to version 3.3, follow the instructions below to replace the old version with the new one.

NOTE: If your hard disk uses multiple partitions created with FDISK, you must use the manual procedure "Upgrading 3.2 Multiple Partitions to 3.3 Extended Partitions," later in this section.

You should use the working copies of the master MS-DOS diskettes that you have already created. (If you have not made working copies of the master MS-DOS diskettes, you should do so now; refer to the instructions in this section for your hardware configuration.)

Note that each instruction is first given in summary form for the experienced user, followed by detailed instructions for those who need them.

Step 1

Transfer the MS-DOS system files to the MS-DOS partition on the hard disk.

Insert the first MS-DOS diskette in drive A and power on the system. Enter the date and time. When the system prompt A> appears type

SYS C:

and press the Enter key. The SYS command transfers the system files to the hard disk.

Step 2

Replace the DOS files on the hard disk with the files on the DOS diskette.

The new version of MS-DOS can contain more files than the previous version. To substitute for the files from a previous version on the hard disk, first replace all of the files common to both versions and then add the new files.

NOTE: If you want to retain older versions of MS-DOS and install MS-DOS 3.3 files in a different subdirectory, use the COPY command instead of the REPLACE command.

Make sure that the DOS diskette is in drive A. To replace all existing files enter

```
REPLACE A:\*.* C:\ /S /R
```

and press Enter.

To add the new files enter

```
REPLACE A:\*.* C:\[path] /A
```

and press Enter.

If your MS-DOS files are in the root directory, you can omit "path."

Repeat step 2 until all MS-DOS diskettes have been copied to the MS-DOS partition on the hard disk.

Upgrading 3.2 Multiple Partitions to 3.3 Extended Partitions

If you have multiple partitions that were created by MS-DOS 3.2, follow these instructions to replace the old version with the new. Use the working copies of the master MS-DOS diskettes that you have already created. (If you have not made working copies of the master MS-DOS diskettes, you should do so now; refer to the instructions in this section for your hardware configuration.)

Note that each instruction is first given in summary form for the experienced user, followed by detailed instructions for those who need them.

Step 1

Back up files from all DOS 3.2 partitions under MS-DOS 3.2.

Back up all files, in all subdirectories, on the hard disk using the old version of the MS-DOS BACKUP command. Type

```
BACKUP C: A: /S
```

and press the Enter key.

Follow the prompts as they appear on the screen. Refer to Section 10 for more information on the BACKUP command.

Repeat the BACKUP procedure for the remaining logical drives.

Step 2 Delete all existing DOS partitions.

In MS-DOS, you must define a hard disk by using the FDISK command. If you want MS-DOS to share a hard disk with one or more operating systems or if you want extended MS-DOS partitions, you must allocate portions of the disk storage space to each operating system. These allocated areas are called partitions. A maximum of four primary partitions are possible on the hard disk. Before you can create the partitions required for MS-DOS 3.30, you must delete all existing MS-DOS 3.20 partitions. For more information on configuring your hard disk, refer to Appendix C in this manual.

NOTE: MS-DOS 3.30 is unable to access information in the nonactive MS-DOS partitions created by MS-DOS 3.2.

Insert the DOS diskette in drive A and power on the system. Enter the date and time. When the system prompt A> is displayed, type:

FDISK

and press the Enter key.

The FDISK menu is displayed:

```
Fixed Disk Setup Program
FDISK Options
Current Fixed Disk Drive: 1
Choose One of the Following:
    1. Create DOS Partition
    2. Change Active Partition
    3. Delete DOS Partition
    4. Display Partition Information
Enter Choice: ..... [1]
Press Esc to return to DOS ... [ ]
```


Type 3 and press the Enter key to delete the existing MS-DOS partition. The following screen appears:

Delete DOS Partition

Current Fixed Disk Drive: 1

1. Delete Primary DOS Partition
2. Delete Extended DOS Partition

Enter choice: [1]

Press Esc to return to FDISK options

Type 1 and press Enter to delete your primary MS-DOS partition. The following screen appears:

Delete Primary DOS Partition

Current Fixed Disk Drive: 1

Partition	Status	Type	Start	End	Size
C: 1	A	PRI DOS	xxx	xxx	xxx
C: 2		PRI DOS	xxx	xxx	xxx
C: 3		PRI DOS	xxx	xxx	xxx

Warning! Data in the Primary DOS partition will be lost. Do you want to continue? .. [N]

Press Esc to return to FDISK options

Press Y and press Enter. The following message appears:

Primary DOS partition deleted

Repeat step 2 until all of the DOS partitions are deleted.

Step 3 Create a primary DOS partition and extended partitions, as required.

Return to the FDISK main menu.

```
Fixed Disk Setup Program

FDISK Options

Current Fixed Disk Drive: 1

Choose One of the Following:

    1. Create DOS Partition
    2. Change Active Partition
    3. Delete DOS Partition
    4. Display Partition Information

Enter Choice: ..... [1]

Press Esc to return to DOS ... [ ]
```

Type 1 and press the Enter key to create your MS-DOS partition. The following screen appears:

```
Create DOS Partition

Current Fixed Disk Drive: 1

    1. Create Primary DOS Partition
    2. Create Extended DOS Partition

Enter choice: [1]

Press ESC to return to FDISK Options
```

Type 1 and press Enter to create your primary MS-DOS partition. The following screen appears:

```
Create Primary DOS Partition

Current Fixed Disk Drive: 1

Do you want to use the maximum size
for a DOS partition and make the
DOS partition active (Y/N).....? [Y]

Press ESC to return to FDISK Options
```

If you intend to use MS-DOS as your only operating system enter Y, or press Enter. Your entire hard disk is dedicated to MS-DOS. Insert the DOS diskette in drive A, and press any key. The system is automatically restarted. Enter the date and time. Continue the installation procedure at step 3 to create an Extended DOS Partition, if required.

If you want to use more than one operating system, enter an N, and press Enter. The following screen appears:

```
Total fixed disk space is nnn cylinders

Maximum available space is nnn

Cylinders at nnn
```

This screen shows the total number of cylinders available on your hard disk. Press Enter and the following prompt appears:

ENTER PARTITION SIZE

Enter the partition size (in cylinders). The minimum practical size is 10 (roughly the size of a flexible diskette). If you leave this blank, MS-DOS defaults to the largest amount of cylinders allowable. When you press Enter, the screen changes to show your new hard disk partition statistics, and you should see the following prompt:

Press Esc to return to FDISK Options. []

Select option 2 from the menu to make the MS-DOS partition active. A screen similar to the following appears:

```
Fixed Disk Setup Program

Change Active Partition

Current Fixed Disk Drive: 1

Partition  Status  Type  Start  End  Size
1           N      DOS    000    xxx   xx

Total disk space is xxx cylinders

Enter the number of the partition you
want to make active ..... [ ]

Press Esc to return to FDISK Options [ ]
```

Enter 1 to make the first partition. Press the Esc key to return to the FDISK options menu. Press it again to restart the operating system from the diskette in drive A.

Step 4

Load the country codes, format the disk, and copy MS-DOS.

After partitioning the hard disk, use the SELECT command to tell MS-DOS your country and keyboard codes, format your MS-DOS partition, and copy the MS-DOS files to your hard disk.

Choose your country and keyboard codes from the table in Appendix D. Make sure that the MS-DOS DRIVERS diskette is in drive A. Type:

```
SELECT C: \[pathname] xxx yy
```

where [pathname] is the directory to which the DOS files are to be copied (for example, \DOS), and xxx is the country code, and yy is the keyboard code you chose from the table. A message appears warning you that SELECT erases everything on the disk and asking you if you want to continue. If you do, press Enter. Another warning message appears and you are asked again if you want to continue. To proceed with formatting, type Y and press Enter.

Formatting a hard disk takes a few minutes. A message appears as the disk is being formatted indicating the head and cylinder numbers. They keep changing as the formatting progresses.

Upon completion, you are asked to enter a volume label. You can enter any unique name or number consisting of up to 11 characters by which you want to identify the hard disk, and press Enter. If no volume label is desired, press the Enter key.

As the files from the DOS diskette are read into memory, the message "Reading source file(s)..." is displayed. The names of the files appear on the screen as they are copied to your hard disk. When the files have been copied, the A> prompt is displayed.

Use the COPY command to transfer the files on the DRIVERS and OPTIONS diskettes to the DOS directory in the DOS partition on the hard disk. Insert the DRIVERS disk in drive A and type

```
COPY A:*. * C: [pathname]
```

(where [pathname] is your DOS directory) and press Enter. The files on the diskette are copied to the hard disk. Each file name is listed on the screen as it is copied. When finished, the number of files copied and the prompt are displayed. Repeat for the OPTIONS diskette.

Step 5 Format any additional DOS logical drives in the extended DOS partition.

If you created an extended DOS partition and the resulting logical drives in step 3, you must format these drives by using the FORMAT command. To format logical drive D, type:

```
FORMAT D: /V
```

and press Enter. The following message is displayed:

```
WARNING, ALL DATA ON THE NON-REMOVABLE DISK  
DRIVE D: WILL BE LOST!  
Proceed with Format (Y/N)?
```

Press Y and press Enter. After formatting has been completed, you are prompted to enter a volume label.

Repeat step 5 for each logical drive.

Step 6 Restore the backed up files under MS-DOS 3.3.

Restore all files in all subdirectories to the hard disk using the RESTORE command. If restoring files to drive C, insert the diskette containing the backed up files in drive A and type

```
RESTORE A: C: /S
```

Press the Enter key. Follow the prompts as they appear on the screen. Refer to the *MS-DOS Reference Manual* (Order No. HU95) for more complete information on the RESTORE command.

Repeat step 6 for all drives previously backed up, restoring to the respective drive.

Upgrading the Hard Disk from DOS 2.x to DOS 3.3

If you already have MS-DOS 2.x on the hard disk and you are upgrading to version 3.3, follow these instructions to replace the old version with the new one. Use the working copies of the master MS-DOS diskettes that you have already created. (If you have not made working copies of the master MS-DOS diskettes, you should do so now; refer to the instructions in this section for your hardware configuration.)

Note that each instruction is first given in summary form for the experienced user, followed by detailed instructions for those who need them.

Step 1 Copy the files AUTOEXEC.BAT and CONFIG.SYS from the root directory to a blank diskette.

If you have the AUTOEXEC.BAT and CONFIG.SYS files and you want to continue using the same files with your new version of MS-DOS, save these files at this time. Use the COPY command to copy the AUTOEXEC.BAT and CONFIG.SYS from the root directory of the hard disk to a blank formatted diskette in drive A.

COPY C:AUTOEXEC.BAT A:

Press the Enter key. When the system prompt A appears, type

COPY C:CONFIG.SYS A:

Press the Enter key.

NOTE: Some CONFIG.SYS command formats supported under previous versions of MS-DOS are no longer supported under version 3.3. Using such commands in your MS-DOS 3.3 CONFIG.SYS file may cause an error. Two examples of such commands are DEVICE=ENHDRV.SYS and DEVICE=VDISK/SIDES/SECTORS/L/E:NNNN. If you plan to save your old CONFIG.SYS file for use with the MS-DOS 3.3, make sure all CONFIG.SYS device commands are still valid. Refer to Appendix B.

- Step 2 Delete all DOS 2.x files from the hard disk. Use the DELETE command to delete the MS-DOS files from the hard disk. To delete all files within a directory, specify the name of the directory (pathname) containing the MS-DOS files in the DELETE command. For example, if all MS-DOS files reside in a directory called SYS on drive C, the following command would delete all files within SYS:

```
DEL C:\SYS
```

Press the Enter key. The message "Are You Sure?" appears.

If the MS-DOS files are not in a subdirectory, you must delete each file. Refer to the *MS-DOS Reference Manual* (Order No. HU95) for more complete information on the DELETE command.

- Step 3 Boot the system from drive A.

Insert the working MS-DOS diskette (labeled DOS) in drive A and reset the system (Ctrl-Alt-Del). Enter the date and time. When the A> prompt is displayed, the system is ready for your commands.

- Step 4 Back up the hard disk.

Back up all remaining files, in all subdirectories, on the hard disk, using the BACKUP command. Type

```
BACKUP C: A: /S
```

Press the Enter key.

Follow the prompts as they appear on the screen.

Step 5 Delete all existing DOS partitions.

In MS-DOS, you must define a hard disk, using the FDISK command. If you want MS-DOS to share a hard disk with one or more operating systems or if you want extended MS-DOS partitions, you must allocate portions of the disk storage space to each operating system. These allocated areas are called partitions. A maximum of four primary partitions are possible on the hard disk. Before you can create the partitions required for MS-DOS 3.30, you must delete all existing MS-DOS 2.x partitions. For more information on configuring your hard disk, refer to Appendix C.

Insert the DOS diskette in drive A and power on the system. Enter the date and time. When the system prompt A> is displayed, type:

FDISK

and press the Enter key.

The FDISK menu is displayed:

Fixed Disk Setup Program

FDISK Options

Current Fixed Disk Drive: 1

Choose One of the Following:

1. Create DOS Partition
2. Change Active Partition
3. Delete DOS Partition
4. Display Partition Information

Enter Choice: [1]

Press Esc to return to DOS ... []

Type 3 and press the Enter key to delete the existing MS-DOS partition. The following screen appears:

Delete DOS Partition

Current Fixed Disk Drive: 1

1. Delete Primary DOS Partition
2. Delete Extended DOS Partition

Enter choice: [1]

Press Esc to return to FDISK options

Type 1 and press Enter to delete your primary MS-DOS partition. The following screen appears:

Delete Primary DOS Partition

Current Fixed Disk Drive: 1

Partition	Status	Type	Start	End	Size
-----------	--------	------	-------	-----	------

C: 1	A	PRI DOS	xxx	xxx	xxx
------	---	---------	-----	-----	-----

Warning! Data in the Primary DOS partition will be lost. Do you want to continue? .. [N]

Press Esc to return to FDISK options

Type Y and press Enter. The following message appears:

Primary DOS partition deleted

Press the Esc key to return to the FDISK options menu.

- Step 6 Create a primary DOS partition and extended partitions, as required.
- Press the Esc key to return to the FDISK options menu.
- The FDISK menu is displayed:

```
Fixed Disk Setup Program
FDISK Options
Current Fixed Disk Drive: 1
Choose One of the Following:
    1. Create DOS Partition
    2. Change Active Partition
    3. Delete DOS Partition
    4. Display Partition Information
Enter Choice: ..... [1]
Press Esc to return to DOS ... [ ]
```

Type 1 and press Enter key to create your MS-DOS partition. The following screen appears:

```
Create DOS Partition
Current Fixed Disk Drive: 1
    1. Create Primary DOS Partition
    2. Create Extended DOS Partition
Enter choice: [1]
Press ESC to return to FDISK Options
```

Type 1 and press Enter to create your primary MS-DOS partition. The following screen appears:

```
Create Primary DOS Partition  
Current Fixed Disk Drive: 1  
Do you want to use the maximum size  
for a DOS partition and make the  
DOS partition active (Y/N).....? [Y]  
Press ESC to return to FDISK Options
```

If you intend to use MS-DOS as your only operating system enter Y, or press Enter. Your entire hard disk is dedicated to MS-DOS. Insert the DOS diskette in drive A, and press any key. The system is automatically restarted. Enter the date and time. Continue the installation procedure at step 3 to create an Extended DOS Partition, if required.

If you want to use more than one operating system, enter an N, and press Enter. The following screen appears:

```
Total fixed disk space is nnn cylinders  
Maximum available space is nnn  
Cylinders at nnn
```

This screen shows the total number of cylinders available on your hard disk. Press Enter, and the following prompt appears:

ENTER PARTITION SIZE

Enter the partition size (in cylinders). The minimum practical size is 10 (roughly the size of a flexible diskette). If you can leave this blank, MS-DOS defaults to the largest amount of cylinders allowable. When you press Enter, the screen changes to show your new hard disk partition statistics, and the following prompt appears:

Press Esc to return to FDISK Options. []

Select option 2 from the menu to make the MS-DOS partition active. A screen similar to the following appears:

```
Fixed Disk Setup Program

Change Active Partition

Current Fixed Disk Drive: 1

Partition  Status  Type  Start  End  Size
1           N      DOS    000    xxx   xx

Total disk space is xxx cylinders

Enter the number of the partition you
want to make active ..... [ ]

Press Esc to return to FDISK Options [ ]
```

Enter 1 to make the first partition active. Press the Esc key to return to the FDISK options menu. Press it again to restart the operating system from the diskette in drive A.

Step 7

Load the country codes, format the disk, and copy MS-DOS.

After partitioning the hard disk, use the SELECT command to tell MS-DOS your country and keyboard codes, format your MS-DOS partition, and copy the MS-DOS files to your hard disk.

Choose your country and keyboard codes from the table in Appendix D. Make sure that the MS-DOS DRIVERS diskette is in drive A. Type:

```
SELECT C: [pathname] xxx yy
```

where [pathname] is the directory where the DOS files are to be copied (for example, \DOS) and where xxx is the country code and yy is the keyboard code you chose from the table. A message appears warning you that SELECT erases everything on the disk and asking you if you want to continue. If you do, press Enter. Another warning message appears and you are asked again if you want to continue. To proceed with formatting, type Y and press Enter.

Formatting a hard disk takes a few minutes. A message appears as the disk is being formatted indicating the head and cylinder numbers. They keep changing as the formatting progresses.

Upon completion, you are requested to enter a volume label. You can enter any unique name or number consisting of up to 11 characters by which you want to identify the hard disk, and press Enter. If no volume label is desired, press the Enter key.

As the files from the DOS diskette are read into memory the message "Reading source file(s)..." is displayed. The names of the files appear on the screen as they are copied to your hard disk. When the files have been copied, the A> prompt is displayed.

Use the COPY command to transfer the files on the DRIVERS and OPTIONS diskettes to the DOS directory in the DOS partition on the hard disk. Insert the DRIVERS disk in drive A and type:

```
COPY a:*. * c: [pathname]
```

(where [pathname] is your DOS directory) and press Enter. The files on the diskette are copied to the hard disk. Each file name is listed on the screen as it is copied. When finished, the number of files copied and the prompt are displayed. Repeat for the OPTIONS disk.

Step 8 Restore the backed up files under MS-DOS 3.3.

Restore all files in all subdirectories to the hard disk, using the RESTORE command. If restoring files to drive C, insert the diskette containing the backed up files in drive A and type

RESTORE A: C: /S

Press the Enter key. Follow the prompts as they appear on the screen. Refer to the *MS-DOS Reference Manual* (Order No. HU95) for more complete information on the RESTORE command.

Step 9 Copy AUTOEXEC.BAT and CONFIG.SYS files.

Copy the files AUTOEXEC.BAT and CONFIG.SYS that you saved in step 1 to the root directory on the hard disk. To copy these files, insert the appropriate diskette in drive A and type

COPY A:AUTOEXEC.BAT C:

COPY A:CONFIG.SYS C:

Section 4
LEARNING FREQUENTLY
USED COMMANDS
AND OPERATIONS

In this section:	See page
Using File Commands.....	4-2
The DIR Command.....	4-2
The COPY Command.....	4-3
The DEL Command.....	4-4
The RENAME Command.....	4-5
The TYPE Command.....	4-6
The PRINT Command.....	4-7
Using Disk Commands.....	4-8
The FORMAT Command.....	4-8
The DISKCOPY Command.....	4-10

Summary In this section you learn how to use file commands,
 how to print files, and how to use disk commands.

USING FILE COMMANDS

You can use several MS-DOS commands to manage your files. Some of the more common commands are DIR, COPY, DEL, RENAME, and PRINT.

NOTE: The examples in this sections assume that drive A is the default drive. Also, many of these examples use file names that are intended for illustrative purposes only. To use these commands, substitute the name of a file on the default disk.

The DIR Command

To display a listing of the files on a disk, you can list its directory by using the MS-DOS DIR command. For example, to display the directory of the diskette in drive B, use the following command:

DIR B:

You could also display the directory on the hard disk by using the drive letter C instead of B with the DIR command. If you use the DIR command without a drive letter, MS-DOS lists the directory of the disk in the default drive.

Example

To see how many files are in the root directory of the diskette in drive A, follow these steps:

1. Make sure the appropriate diskette is in drive A.
2. Make sure the disk drive door (for drive A) is closed (if applicable).
3. At the MS-DOS prompt, type the following command, then press the Enter key:

DIR

4. If the disk drive door (for drive A) is open when to try to use this command, MS-DOS will display the following error message:

Not ready error reading drive A
Abort, Retry, Ignore?_

To fix this error, close the door for drive A and type R (for Retry).

5. MS-DOS then displays the directory. If necessary, you can stop the directory listing from scrolling by pressing Ctrl-S. To view the rest of the display, press any key.

The COPY Command

You can use the COPY command to copy one or more files, either on the same disk or from one disk to another.

Example

To copy the SALES.DOC file and call the new copy MONTHLY.RPT, follow these steps:

1. Make sure that the diskette with the SALES.DOC file is in drive A and that A is the default drive.
2. At the MS-DOS prompt, type the following command:

COPY SALES.DOC MONTHLY.RPT

3. Press the Enter key.

You cannot give the new copy of a file the same name as the original. You can, however, copy a file from one disk to another and keep the same file name. For example, to copy a file from the diskette in drive A to the diskette in drive B, use the following command:

COPY A:SALES.DOC B:SALES.DOC

NOTE: In the previous example, if A is the default drive (that is, if the prompt is A>), you do not need to type the letter A, followed by a colon, before the first file name. If you do not specify a new name, the copy will also have the name of the original file. For example, the following commands all produce the same result:

```
COPY A:SALES.DOC B:SALES.DOC
```

```
COPY SALES.DOC B:SALES.DOC
```

```
COPY SALES.DOC B:
```

Again, by substituting the drive letter C for B, you can copy the SALES.DOC file to drive C.

The DEL Command

You may need to remove old or unnecessary files to clean up your file system. To erase a file from a disk, you can use the MS-DOS DEL command. Remember that the DEL command permanently erases the file. To delete an old SALES.DOC file from the diskette in drive B, use the following command at the DOS prompt:

```
DEL B:SALES.DOC
```

You could also delete a file named SALES.DOC from drive C by substituting the letter C for B.

Example

If you have an old copy of the SALES.DOC file that you no longer need, you can delete this file from the diskette in the default drive by following these steps:

1. Make sure that the diskette with the SALES.DOC file is in the default drive.
2. At the MS-DOS prompt, type the following command:

```
DEL SALES.DOC
```


3. Press the Enter key. MS-DOS deletes the SALES.DOC file from the diskette.

NOTE: The DEL command does not work if you type the word DELETE. You can, however, substitute the word ERASE in place of the DEL command.

The RENAME Command

Occasionally, you may want to change the name of a file. For example, you may have a file named MONTHLY.RPT on a disk. When you add other monthly reports to your disk, you may want to change the name of the original file to something more specific. To change the name to ANNUAL.RPT, for instance, use the following command:

```
RENAME MONTHLY.RPT ANNUAL.RPT
```

You can only rename files on the same disk, so you cannot change MONTHLY.RPT to B:MONTHLY.RPT or C:MONTHLY.RPT.

Example

To rename a file named PAYROLL.DOC, on the diskette in the default drive, to SALARY.DOC, follow these steps:

1. Make sure that the diskette with the PAYROLL.DOC file is on the diskette in the default drive (A).
2. At the MS-DOS prompt, type the following command:

```
RENAME PAYROLL.DOC SALARY.DOC
```

3. Press the Enter key.

NOTE: You can abbreviate the RENAME command to REN.

The TYPE Command

To display a file that contains text on the screen, use the TYPE command. For example, if you have created a file named PHONE.LST on the diskette in drive A, and you want to check one of the phone numbers, use the following command to display the file on the screen:

```
TYPE A:PHONE.LST
```

Example

If you want to check your employee's salary figures, contained in a file named SALARY.DOC that is on the diskette in the default drive, follow these steps:

1. Make sure that the diskette with the SALARY.DOC file is in the default drive (A).
2. At the MS-DOS prompt, type the following command:

```
TYPE SALARY.DOC
```

3. Press the Enter key.

MS-DOS displays the SALARY.DOC file on the screen. If the SALARY.DOC file is on drive B or C, type the drive letter, followed by a colon, with the TYPE command.

Hints

- If the file is too long to fit on the screen, you can press Ctrl-S to prevent it from scrolling off the screen. When you press any other key, the file resumes scrolling.
- MS-DOS displays only text files on the screen. If you try to display a program file (one with an extension of .COM or .EXE), you will see only strange symbols on the screen.
- If you have an application program that creates files, you may need to run the application to view them. For example, if you use *Microsoft Multiplan(R)* to create a file, *Multiplan* automatically adds the extension .MP to the file name. You then have to start *Multiplan* to view the file.

The PRINT Command

If you have a printer attached to your PC, you can print files with the MS-DOS PRINT command. For example, if you have a file named *INVEST.MNT*, and want to print it on your printer, use the following command:

```
PRINT INVEST.MNT
```

Example

You have a file that contains a list of investors and their phone numbers, and you want to print this file and keep it near your phone. The file is named *INVEST.MNT* and is on the diskette in drive B. Drive A is the default drive (A> is the prompt). To print the *INVEST.MNT* file, follow these steps:

1. Make sure that the MS-DOS diskette is in drive A.
2. Make sure that the diskette with the *INVEST.MNT* file is in drive B.
3. Check to see that your printer is on, has paper, and is ready to print.
4. At the MS-DOS prompt, type the following command:

```
PRINT B:INVEST.MNT
```

5. Press the Enter key.
6. MS-DOS prompts you for the name of the printing device connected to your PC (this name is usually the communications port that the printer cable connects to). Type the name, or press the Enter key to print to the default printer.

If the master diskette is not in drive A, MS-DOS prompts you to insert it in the drive.

Hints

- While a file is being printed, you can type other commands to MS-DOS. You can even run other programs or create and modify files. However, because printing a file takes a lot of your PC's resources, your tasks may take longer if you try to do them while you are printing a file. Therefore, if you have a long file to print, you might schedule the printing for a time when you plan to be away from your PC.

- In addition, to print a file that you have created with an application program, you may also have to use the application program print command to print the file.

USING DISK COMMANDS

This section describes two commands that you use with diskettes: **FORMAT** and **DISKCOPY**.

The FORMAT Command

When you purchase new diskettes, they are usually blank and unformatted. You must format them before MS-DOS can use them. Formatting structures a disk so that MS-DOS can find and store information on it. Formatting also checks the disk for defective spots. You can format a disk by using the **FORMAT** command.

WARNING

The format program destroys any information already on a disk. It is a good idea to check the directory of a disk before you format it, just to make sure you do not destroy any important files.

To format a blank diskette in drive B, use the following command:

```
FORMAT B: /V
```

NOTE: If you have only one diskette drive, MS-DOS prompts you to insert the diskette that you want to format.

You can also format a blank disk in such a way that some special MS-DOS files are copied onto it during formatting. These files are necessary only if you use the disk to start MS-DOS. To format a blank diskette in drive B and include these special MS-DOS files, use the following command:

```
FORMAT B: /V /S
```


If you do not want to use the disk to start MS-DOS, you do not need to specify the /s option when you format the disk. If you have a diskette and do not know whether you can use it to start MS-DOS, put the diskette into drive A and press the Ctrl-Alt-Del key combination. If the diskette does not contain system files, MS-DOS displays an error message. Insert the system diskette, and press Enter to continue.

Example

You need to create a new data disk to hold some tax records, but you do not want to copy the special MS-DOS files when formatting the disk. To format and label a blank diskette (in drive B) without including the special MS-DOS files, follow these steps:

1. Make sure that the MS-DOS diskette is in drive A.
2. At the MS-DOS prompt, type the following command:

FORMAT B: /V

3. Press the Enter key. Your screen should look like this:

A>format b: /v
Insert new diskette for drive B:
and strike ENTER when ready_

4. Insert a blank diskette in drive B.
5. Press the Enter key to start the format process. When formatting is complete, MS-DOS displays the following prompt:

Volume label (11 characters, ENTER for none)?
6. Type a label that identifies the contents of this diskette (for example, DATA DISK), and press the Enter key. MS-DOS then asks:

Format another? (Y/N)

7. Type N (for No) to exit the FORMAT program.

Your diskette is formatted and ready to use. Be sure to label it on the outside cover, and remember to include the volume label that you used in step 6. The label reminds you that you have formatted the diskette and helps you identify its contents.

The DISKCOPY Command

You may often need to make copies of entire diskettes instead of individual files. You can do this with the MS-DOS DISKCOPY command. To use the DISKCOPY command, you must have:

- An MS-DOS diskette
- A diskette you want to copy
- A blank diskette to put the copy on.

To copy the contents of a diskette in drive A to a diskette in drive B, use the following command:

```
DISKCOPY A: B:
```

NOTE: You cannot use the DISKCOPY command to copy the contents of a diskette to or from a hard disk. Instead, you must use the COPY command or the XCOPY command.

Example

You want to bring a data diskette with you on a business trip, but you do not want to take your original diskette because it might get damaged. Use the DISKCOPY command to make a copy of the diskette. For example, to copy the contents of a diskette in drive A to a diskette in drive B, follow these steps:

1. Put your MS-DOS diskette in drive A.
2. At the MS-DOS prompt, type the following command:

```
DISKCOPY A: B:
```

3. Press the Enter key. Your screen should look like this:

```
A>diskcopy a: b:
Insert SOURCE diskette in drive A:
Insert TARGET diskette in drive B:
Press any key when ready...
```

4. Remove the MS-DOS diskette from drive A, replacing it with the diskette you want to copy (SOURCE). Then place a blank diskette (TARGET) in drive B.
5. Press the space bar to start the copy process. When the diskette has been copied, MS-DOS asks:

Copy another? (Y/N)
6. Type N (for No) to exit the DISKCOPY program.

Section 5

RUNNING APPLICATIONS WITH MS-DOS

In this section:	See page
Running Application Programs.....	5-2
Starting an Application From a Hard Disk.....	5-3
A Note About Using Application Programs.....	5-3

Summary In this section you learn how to run application programs.

RUNNING APPLICATION PROGRAMS

MS-DOS lets you run many different application programs, including spreadsheets, word processing programs, and graphics packages.

Once you have started MS-DOS, you can run an application program as described below.

- Step 1 If drive A is not the default drive, change the default drive to A.
- Step 2 Put the application program diskette in drive A (the default drive).
- Step 3 Type the name of the application program you want to run.
- Step 4 Press the Enter key.

- Example To start a word processing application called *Phrase* that you want to use to write a monthly status report, follow these steps:
- 1. Make sure that the default drive is drive A.
 - 2. Put your *Phrase* disk into drive A.
 - 3. Type the name PHRASE (supposing phrase is the word used to start the application).
 - 4. Press the Enter key to start *Phrase*.

Starting an Application From a Hard Disk

To run an application that is on your hard disk (drive C), follow these steps:

- Step 1 Change the default drive to C, the drive that contains the application program.
- Step 2 Type the name of the application program you want to run.
- Step 3 Press the Enter key.

Example To start a graphics program called *Canvas* in drive C, and use it to create a chart showing the current month's sales data, follow these steps:

1. Change the default drive to drive C.
2. Type CANVAS (supposing Canvas is the word used to start the application).
3. Press the Enter key to start *Canvas*.

A Note About Using Application Programs

After exiting some application programs, especially programs that use a lot of memory, you may receive the following error message from MS-DOS:

Non-System disk or disk error

Replace and strike any key when ready

This message does not mean you have ruined your application program or your PC. It appears because your application used so much of the PC's memory that it wrote over the MS-DOS COMMAND.COM file that was previously stored in memory. To fix the error, reinsert a diskette that contains a copy of COMMAND.COM in the default drive (this COMMAND.COM file must be the same version you used to start MS-DOS). Press any key to continue. The operating system reloads COMMAND.COM into memory, and you can continue using your PC.

Section 6

SETTING UP MS-DOS

In this section:	See page
Special MS-DOS Files.....	6-2
The CONFIG.SYS File.....	6-2
A Sample CONFIG.SYS File.....	6-2
Creating a CONFIG.SYS file.....	6-3
The AUTOEXEC.BAT File.....	6-4
How These Special Files Differ.....	6-6

Summary	In this section you learn about the CONFIG.SYS file, the AUTOEXEC.BAT file, and the differences between the two.
---------	--

SPECIAL MS-DOS FILES

This section discusses CONFIG.SYS and AUTOEXEC.BAT, two special files that you can use to set up MS-DOS. You can use MS-DOS without these files, but they help you take greater advantage of the operating system as you run commands, application programs, and use devices. In addition to taking greater advantage of DOS, these special files save time, by doing tasks for you each time you start MS-DOS.

The CONFIG.SYS File

When you start MS-DOS, it automatically searches for a file named CONFIG.SYS on your system disk. This file contains special commands that let you set up (configure) MS-DOS for use with devices or application programs.

You can use the DIR command to see whether the CONFIG.SYS file is already on your MS-DOS disk. If the file is not on the disk, you can use Edlin to create it. If it is on the disk, you can use either the TYPE command to display it or Edlin to edit it.

A Sample CONFIG.SYS File

Although your CONFIG.SYS file should contain the following commands, do not worry if the file contains more than these two commands:

```
BUFFERS=20
```

```
FILES=20
```

The command BUFFERS=20 sets the number of buffers, or blocks of memory, that MS-DOS uses to store data. If your directory system is large, you might want to set the buffer's number higher, to 30, for example.

The second command in the CONFIG.SYS file is FILES=20. This command sets the number of files that MS-DOS can have open at the same time. Programs such as spreadsheets and data bases require several files to be open while they are running. If you do not set a value for files in your CONFIG.SYS file, MS-DOS assumes a value of 8, which would not be enough open files for a large program like a data base.

NOTE: If you are using MS-DOS with *Microsoft Networks*, you should set the FILES command equal to 255.

You may also want to add other commands to the file to configure MS-DOS for devices, such as a mouse. Refer to the manual that came with the device, or to Appendix A for more information about how to do this.

Creating a CONFIG.SYS file

If you do not have a CONFIG.SYS file on your MS-DOS disk, follow these steps to create one.

1. Type the following command line, then press the Enter key:

EDLIN CONFIG.SYS

2. At the Edlin asterisk (*) prompt, type the letter I (for Insert) and press the Enter key.
3. On line 1, type the CONFIG.SYS command BUFFERS=20, and press the Enter key.
4. On line 2, type the command FILES=20, and press Enter, followed by Ctrl-C.
5. At the asterisk (*), type the letter E (for End). You are returned to the MS-DOS prompt.

MS-DOS performs the commands in the CONFIG.SYS file only when you first start the system. Therefore, for your changes to take effect, you must restart MS-DOS after editing this file.

For more information about the CONFIG.SYS file and the CONFIG.SYS commands, refer to Appendix A.

The AUTOEXEC.BAT File

MS-DOS also searches for a second file when you start your PC. This file is called AUTOEXEC.BAT. It performs any set of commands you would normally give when you start MS-DOS. For example, you might use the file to prepare MS-DOS for running an application program.

If there is an AUTOEXEC.BAT file on the disk when you start MS-DOS, MS-DOS does not automatically prompt you for the time and date when you power on your PC. Therefore, unless you have an installed clock in your PC, it is a good idea to put the TIME and DATE commands in your AUTOEXEC.BAT file. This way, MS-DOS prompts you for the time and date, and keeps the time and date information current for the directory on your disk.

To see if the AUTOEXEC.BAT file is already on your MS-DOS disk, type the DIR command. If the file is not on the disk, you can use Edlin to create it, as you did with the CONFIG.SYS file. If the AUTOEXEC.BAT file is on the disk, you can use either the TYPE command to display it, or Edlin to edit it.

Examples

For a PC with two diskette drives, a typical AUTOEXEC.BAT file might contain the following lines:

```
DATE
```

```
TIME
```

```
PATH=A:
```

```
DIR
```

In this sample file, the DATE and TIME commands ask you to set the date and time each time you start MS-DOS. The command PATH=A: tells MS-DOS to look for commands or programs on drive A in addition to the default directory. The DIR command displays the default directory of the disk in the default drive as soon as you start MS-DOS on your PC.

The next sample AUTOEXEC.BAT file is for PCs with one diskette drive and one hard disk drive. It might contain the following lines:

DATE

TIME

PATH=C:;A:

PROMPT=\$P\$G

DIR

The commands in this AUTOEXEC.BAT file differ slightly because the file is intended for PCs with a hard disk. For instance, the PATH command line now contains c:; in addition to a:, because when you give a command or start an application, you may want MS-DOS to search two drives, first C, then A.

Another new command in this file is the PROMPT=\$P\$G command, which tells MS-DOS to display the default drive and directory, followed by a greater-than sign (>) as the MS-DOS prompt. This prompt is handy because it reminds you what drive and directory you are in at the moment.

Also, if you want to start a certain application program every time you start MS-DOS (for example, *Microsoft Word*), you can include the command to start that application (word) at the end of the AUTOEXEC.BAT file.

Once you become more familiar with MS-DOS, you will probably want to vary these commands, or include others. For more information about AUTOEXEC.BAT files or the commands used in these examples, refer to Section 8.

How These Special Files Differ

MS-DOS uses the CONFIG.SYS and AUTOEXEC.BAT files in different ways because they perform different types of commands. While the AUTOEXEC.BAT file may contain any MS-DOS command or program, the CONFIG.SYS file may contain only a special set of configuration commands.

In addition, you must restart MS-DOS to perform the commands in the CONFIG.SYS file. But to perform the commands in the AUTOEXEC.BAT file, type the word AUTOEXEC.

Section 7

MANAGING YOUR DIRECTORIES AND FILES

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How MS-DOS Keeps Track of Your Files.....	7-3
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Summary	In this section you learn about protecting and keeping track of your files, working with multilevel directories, and using wildcards.
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BEFORE YOU START

Before you read this section, you should already know how to start MS-DOS, format and make backup copies of disks, copy and delete files, and run programs. If you are unfamiliar with how to do any of these actions, just refer to the earlier sections in this manual for more information.

PROTECTING YOUR FILES

The MS-DOS operating system is a powerful and useful tool for processing personal and business information. As with any computer, this information must be protected, since errors can occur and information can be misused. If you are doing work that cannot be replaced or that requires security, you should protect your programs.

You can take simple but effective measures like putting your diskettes away when you are not using them, or covering the write-protect notch on your program diskettes. Another way to protect your programs is by installing your equipment in a secure office or work area. Also, if your diskettes contain valuable information, you should make backup copies of them on a regular basis.

HOW MS-DOS KEEPS TRACK OF YOUR FILES

File Allocation Table

To keep track of the files that it stores in directories, MS-DOS uses an area on a disk called the File Allocation Table. When you format a disk with the FORMAT command, MS-DOS copies this table onto the disk and creates an empty directory, called the root directory. On each of your disks, the directories store the files, and the File Allocation Table keeps track of their locations. The table also allocates the free space on your disks so that you have enough room to create new files.

These two system areas, the directories and the File Allocation Table, enable MS-DOS to recognize and organize the files on your disks. To check these areas on a disk for consistency and errors, use the MS-DOS CHKDSK command.

For example, to check the diskette in drive A, type the CHKDSK command, followed by A:.

In response, MS-DOS displays a status report listing any errors it has found, such as files that show a nonzero size in the directory but that really have no data in them.

For more information on CHKDSK, refer to Section 3, in the *MS-DOS Reference Manual* (Order No. HU95).

MULTILEVEL DIRECTORIES

When there is more than one user on your PC, or when you are working on several different projects, the number of files in a directory can become large and unwieldy. To deal with this large number of files, you may want to keep your files separate from a co-worker's, or organize your programs into convenient categories.

In an office, you can separate and organize files that belong to different people or that relate to specific projects by putting them in different file cabinets. You can do the same thing with MS-DOS by putting your files in different directories.

Directories let you group your files in convenient categories. These directories, in turn, may contain other directories (referred to as subdirectories). This organized file structure is called a multilevel or hierarchical directory system.

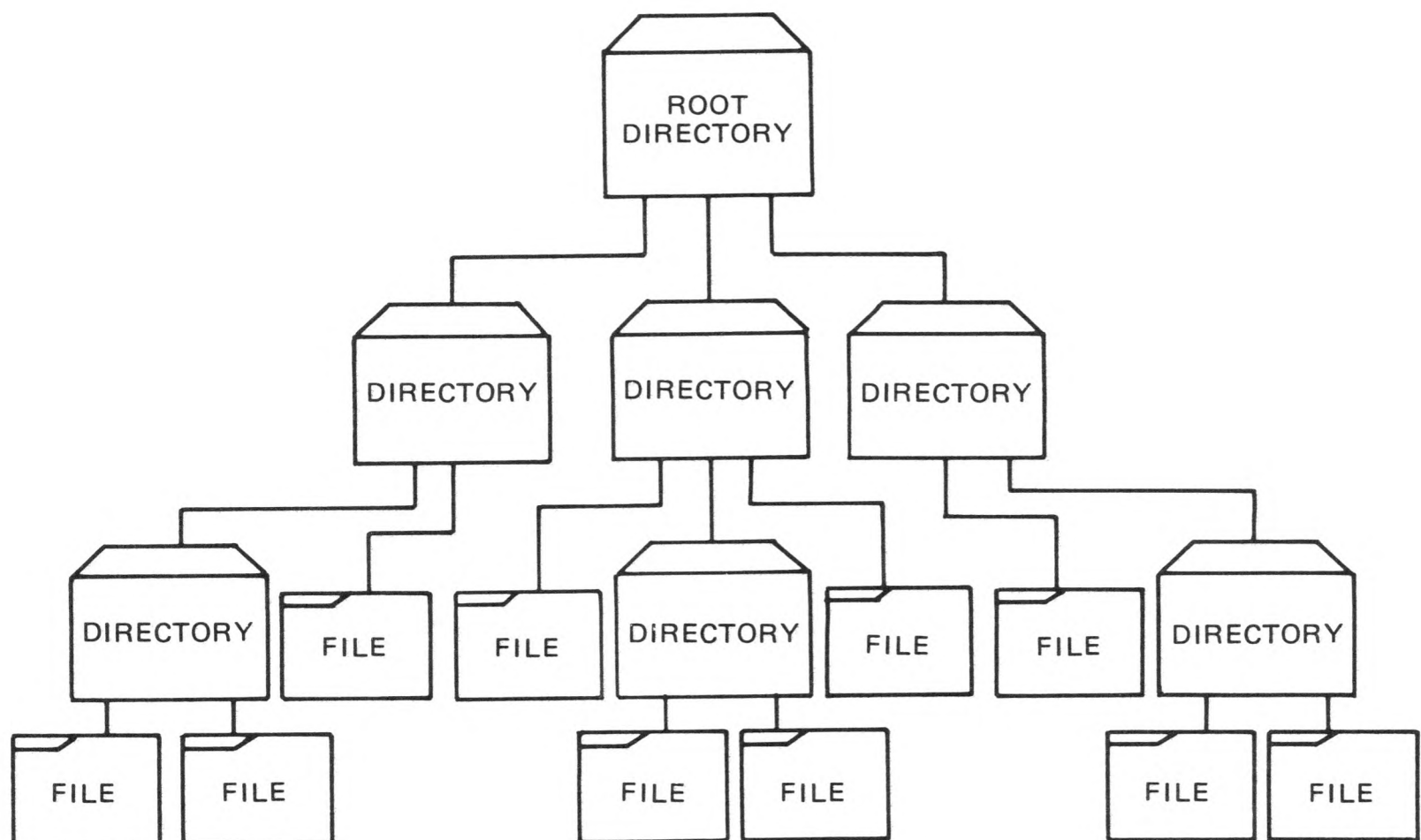
NOTE: The maximum number of files or directories that the root directory can contain varies, depending on the type of disk and disk drive you are using. Usually, the maximum number is 112 for a double-sided, double-density 5-1/4 inch diskette. The maximum number of entries in the root directory of a 1.44-megabyte, 3-1/2 inch diskette is 224. This maximum capacity for a root directory can vary depending upon how the disk is formatted. The number of subdirectories on a disk is not restricted.

The Root Directory

The first level in a multilevel directory is the root directory, which is automatically created when you format a disk and start putting files on it. Within the root directory, you can create additional directories and subdirectories.

As you create new directories for groups of files or for other people using the PC, the directory system grows. And within each new directory you can add new files or create new subdirectories.

You can move around in the multilevel system by starting at the root and "traveling" through intermediate subdirectories to find a specific file. You can also start anywhere within the file system and travel toward the root. Or, you can go directly to any directory without traveling through intermediate levels.

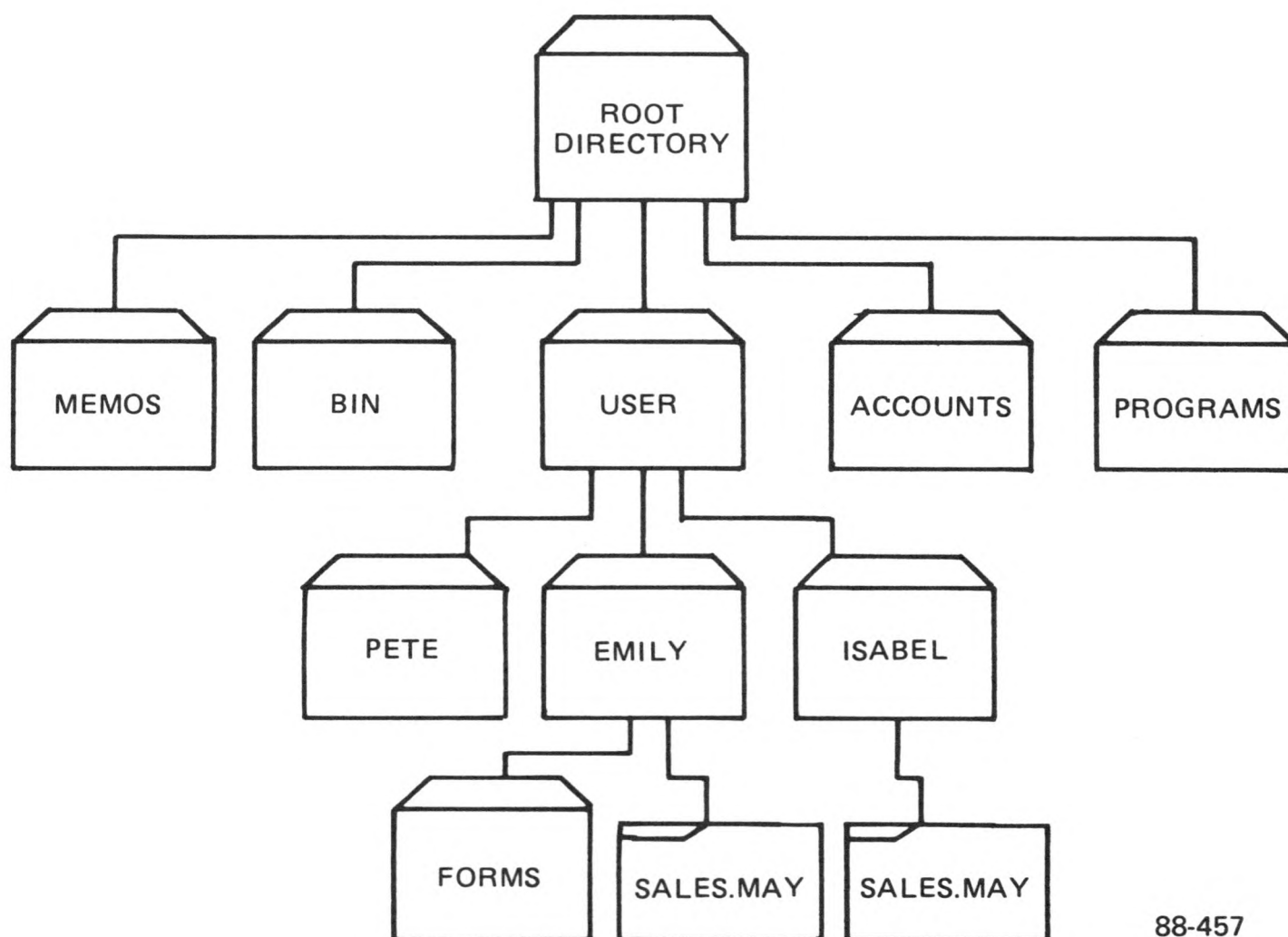


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Your Working Directory

The directory that you are in is called the working directory. The file names and commands discussed in this section relate to your working directory and do not apply to any other directories in the structure. When you start your PC, you start out in the working directory. Similarly, when you create a file, you create it in the working directory.

Because you can put files in different directories, you and your co-workers can have files with the same names, but with unrelated content. The following figure illustrates a typical multilevel directory structure:



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In this example, five subdirectories of the root directory have been created. These subdirectories are

- A directory of external commands, named BIN.
- A USER subdirectory containing separate subdirectories for all users of the system.
- A directory containing accounting information, named ACCOUNTS.

- A directory of programs, named PROGRAMS.
- A directory of text files, named MEMOS.

As you can see, Pete, Emily, and Isabel each have their own directories, which are subdirectories of the user directory. Emily has a subdirectory named FORMS, and both Emily and Isabel have SALES.MAY files in their directories, even though Isabel's SALES.MAY file is unrelated to Emily's.

This organization of files and directories is not important if you work only with files in your own directory. But if you work with someone else or on several projects at once, the multilevel directory system becomes handy. For example, you could get a list of the files in Emily's FORMS directory by typing the following command:

```
DIR \USER\EMILY\FORMS
```

Note that a backslash (\) separates directories from other directories and files. In this example, the first backslash includes the root directory. The use of the backslash alone indicates the root directory. For example, the following command displays a list of the files in the root directory:

```
DIR \
```

To list the files Isabel has in her directory, you would type the following command:

```
DIR \USER\ISABEL
```

This command tells MS-DOS to travel from the root directory to the USER directory to the ISABEL directory, and to then display all file names in the ISABEL directory.

USING PATHS AND PATHNAMES

When you use multilevel directories, you must tell MS-DOS where the files are located in the directory system. Both Isabel and Emily, for example, have files named SALES.MAY. Each would have to tell MS-DOS in which directory her file resides when she wants to use it. This is done by giving MS-DOS a pathname to the file.

What is a Pathname?

A pathname is a sequence of directory names followed by a file name. Each directory name is separated from the previous one by a backslash (\). A path differs from a pathname in that it does not include a file name.

The general form of a pathname is as follows:

```
[\\directoryname] [\\directoryname...]  
\\filename
```

A pathname can contain any number of directory names, up to a total length of 63 characters. If a pathname begins with a backslash, MS-DOS searches for the file beginning at the root of the directory system. Otherwise, it begins at the working directory and searches along the path from there. Here are two samples:

```
\\USER\\EMILY\\SALES.MAY
```

The pathname of Isabel's SALES.MAY file is

```
\\USER\\ISABEL\\SALES.MAY
```

When you are in your working directory, you can use a file name and its corresponding pathname interchangeably. Some sample names are:

```
\\
```

The root directory.

```
\\PROGRAMS
```

A directory under the root directory that contains program files.

`\USER\ISABEL\FORMS\1040`

A typical full pathname. This one is for a file named 1040 in the forms directory, which belongs to Isabel.

`SALES.MAY`

A file in the working directory.

Parent Directories

A parent directory is any directory that contains subdirectories. MS-DOS provides special shorthand notations for the working directory and the parent of the working directory, and automatically creates these two entries whenever you create a directory:

- . MS-DOS uses the shorthand name "." to indicate the name of the working directory in all multilevel directory listings.
- .. These two dots are the shorthand name ".." for the working directory's parent directory (one level up). If you type the DIR command followed by two dots, MS-DOS lists the files in the parent directory of your working directory.

If you type the following command, MS-DOS lists the files in the parent's parent directory:

`DIR ..\..`

USING WILDCARDS

If you are using multilevel directories, you will find it easier to search for files on your disks if you use two special characters, called wildcards. These wildcard characters are the asterisk (*) and the question mark (?). They are useful in MS-DOS command lines because they give you flexibility when you are specifying paths and files.

Using The ? Wildcard

A question mark (?) in a file name or file name extension means that any character can occupy that position. The following command, for example, lists all file names on the default drive that begin with the characters MEMO, that have any character in the next position, that end with the characters AUG, and that have an extension of .TXT:

```
DIR MEMO?AUG.TXT
```

Here are some examples of files that might be listed by the preceeding command:

```
MEMO2AUG.TXT
```

```
MEMO9AUG.TXT
```

```
MEMOBAUG.TXT
```


Using The * Wildcard

An asterisk (*) used in a file name or file name extension means that any character can occupy that position or any of the remaining positions in the file name or extension. For example, the following command lists all of the directory entries on the default drive with file names that begin with the characters MEMO and that have an extension of .TXT:

```
DIR MEMO*.TXT
```

Here are some samples of files that might be listed by this command:

```
MEMO2AUG.TXT
```

```
MEMO9AUG.TXT
```

```
MEMOBAUG.TXT
```

```
MEMOJULY.TXT
```

```
MEMOJUNE.TXT
```

MS-DOS ignores any file name characters that follow the asterisk wildcard, up to the period that separates the file name from its extension. For example, the command DIR *1.MEM lists all of the files in the directory with the extension .MEM, not just those files whose names end with the number 1.

IMPORTANT

The wildcard abbreviation *.* refers to all files in the directory. This feature can be both powerful and destructive when used with MS-DOS commands. For example, the DEL command followed by the wildcard abbreviation *.* deletes all files on the default drive current directory, regardless of file name or extension.

Examples

If you want to find a certain accounting file but cannot remember its exact name, you can list the directory entries for all files named ACCOUNTS in the default directory of drive A (regardless of their file name extensions). To do this quickly, you could just type the following command:

```
DIR A:ACCOUNTS.*
```

Similarly, to list the directory entries for all files with .TXT extensions or in a directory called REPORTS (regardless of their file names) on the disk drive B, type the following command:

```
DIR B:\REPORTS\*.TXT
```

This command is useful if your text files have .TXT extensions. For example, by using the DIR command with wildcard characters, you could get a listing of all your text files, even if you do not remember their file names. Refer to Section 3 of the *MS-DOS Reference Manual*, (Order No. HU95), for more information on the DIR command.

USING DIRECTORIES

The following subsections describe how to display, change, and delete any directory. You will also learn how to create directories and subdirectories.

Creating a New Directory

To create a subdirectory in your working directory, use the MDKIR (make directory) command. This command can be abbreviated MD. For example, to create a new directory named USER under your working directory, type the following command:

```
MD USER
```

After MS-DOS runs this command, a new directory exists under your working directory. You can also make directories anywhere in the directory structure by specifying MD followed by a path. MS-DOS automatically creates the "." and ".." entries in the new directory.

To create files in the new directory, you can use the MS-DOS line editor, Edlin. Section 6 in the *MS-DOS Reference Manual* describes how to use Edlin to create and save files. You can also create and save files if you have a word processing program.

Changing Directories

To change from your working directory to a different directory, type the CHDIR (change directory) command followed by a path. This command can be abbreviated CD. For example, to change the working directory to \USER, type the following:

```
CD\USER
```

You can specify any path after the command to travel around the directory structure. The following command, for example, puts you in the parent directory of your working directory:

```
CD...
```

Displaying Your Current Directory

All commands are executed while you are in your working directory. You can find out the name of the directory you are in by typing the MS-DOS CD command with no path. For example, if your working directory is \USER\PETE, when you type CD and press the Enter key, you see the following:

```
A:\USER\PETE
```

This message shows your working drive, A, plus your working directory, \USER\PETE.

To see the contents of the \USER\PETE directory, you can use the DIR command. The subdirectory might look like this:

```
Volume in drive A has no ID
Directory of A:\USER\PETE

.                <DIR>          08-09-87  10:09a
..               <DIR>          08-09-87   0:09a
TEXT             <DIR>          08-09-87  10:09a
FILE1  TXT  <DIR>  243  08-04-87  09:30a
4 File(s)       836320 bytes free
```

Note that MS-DOS lists both files and directories in the output. As you can see from the display, Pete has a subdirectory named TEXT. The ".." is short for the parent directory \USER, and FILE1.TXT is a file in the \USER\PETE directory. All of these directories and files are on the diskette in drive A.

NOTE: Because files and directories are listed together, you cannot give a subdirectory the same name as a file in that directory. For instance, if you already have a path \USER\PETE, where PETE is a subdirectory, you cannot create a file named PETE in the \USER directory.

Removing a Directory

If you create a directory and decide later that you do not want it any more, you can delete it with the MS-DOS RMDIR (remove directory) command. This command can be abbreviated RD.

The RD command lets you delete any directory by specifying its path, but the directory must be empty except for the "." and ".." entries. This prevents you from accidentally deleting files and directories.

To remove all of the files in a directory (except for the "." and ".." entries), type DEL followed by the path of the directory. For example, to delete all of the files in the \USER\EMILY directory, type the following command:

```
DEL \USER\EMILY
```

MS-DOS prompts you with the following message:

```
Are you sure (Y/N)?
```

To delete all the files in the directory, type Y (for Yes). Type N (for No) to stop the command. Remember that this command deletes all of the files in the subdirectory, but does not delete any subdirectories that may exist under \USER\EMILY.

Now you can use the RD command to delete the \USER\EMILY directory by typing the following command:

```
RD \USER\EMILY
```

Renaming a Directory

There is no command to rename a directory in MS-DOS. You can, however, rename a directory that has no subdirectories. For example, if you want to rename the \USER\PETE directory and call it \USER\EMILY, follow these steps (remember to press the Enter key after each step):

Step 1 To create a new directory, type:

```
MD \USER\EMILY
```

Step 2 To copy the files from the old directory to the new directory, type:

```
COPY \USER\PETE\*.* \USER\EMILY
```

Step 3 To delete the contents of the old directory, type:

```
DEL \USER\PETE\*.*
```

(Type Y in response to the prompt "Are you sure?")

Step 4 To remove the old directory, type:

```
RD \USER\PETE
```

Section 8

BATCH PROCESSING

In this section:	See page
Why Use Batch Files?.....	8-2
Creating and Running Batch Files.....	8-2
About Batch Processing.....	8-4
The AUTOEXEC.BAT File.....	8-5
How to Create an AUTOEXEC.BAT File.....	8-7
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CALL.....	8-15
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PAUSE.....	8-22
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Summary In this section you learn how to create a batch file, how an AUTOEXEC.BAT file works, how to use replaceable parameters in a batch file, and how to run a batch file.

NOTE: If you are not writing batch programs you do not need to read this section.

WHY USE BATCH FILES?

You may often find yourself repeatedly typing the same sequence of commands to perform some common task. With MS-DOS you can put this command sequence into a special file called a batch file, and then run the whole sequence of commands by typing the name of the batch file. Note that you do not need to type the batch file's extension, even though all of your batch files must include the .BAT extension in their file names.

MS-DOS performs these "batches" of your commands as if you had typed them from the keyboard. This is called batch processing. By using a batch file, you only have to remember to type one command, instead of several. In effect, you use batch files to create personalized commands.

CREATING AND RUNNING BATCH FILES

You can create a batch file by using Edlin, the MS-DOS line editor, by using the COPY command, or by using a word processor that saves files as ASCII text. To create files with Edlin, refer to Section 6 in the *MS-DOS Reference Manual* (Order No. HU95). The examples in this section show you how to use the COPY command to create batch files.

For example, to create a batch file to format and check a new disk, follow these steps:

Step 1 Type the following:

```
COPY CON CHECKNEW.BAT
```

Press Enter. This command tells MS-DOS to copy the information from the console (keyboard) to the file CHECKNEW.BAT.

Step 2 Type the following lines, pressing the Enter key after each:

```
REM THIS IS A FILE TO FORMAT AND  
REM CHECK NEW DISKS.  
REM IT IS NAMED CHECKNEW.BAT.  
PAUSE INSERT NEW DISK IN DRIVE B:  
FORMAT B:  
CHKDSK B:
```

Step 3 After the last line, press Ctrl-Z and then press Enter to save the batch file. MS-DOS displays the message

```
1 File(s) copied  
  
to show that it created the file.  
  
To execute the file, type:
```

```
CHECKNEW
```

The result is the same as if you had typed the lines in the .BAT file from the keyboard as individual commands.

ABOUT BATCH PROCESSING

Here are a few things you should know before you run a batch process with MS-DOS:

- You must name each batch file with an extension of .BAT.
- To execute a batch file, type its file name, with or without the extension.
- If you press Ctrl-C while the batch file is running, MS-DOS asks you to confirm that you want to terminate the batch process.
- If you remove the diskette that contains a batch file being run, MS-DOS prompts you to reinsert the diskette so that it can continue processing the file.
- You can specify the name of another batch file as the last command in a batch file. This feature allows you to call one batch file from another when the first has finished.
- You can use any of the redirection symbols (< > >>) in a batch file. For more information on using these symbols, refer to Section 9.
- You can use an at (@) sign at the front of a command line in a batch file to prevent that line from echoing to the screen.
- You can use the pipe symbol (|) in a batch file.
- Setting the directory or drive affects every subsequent command in the batch file.

NOTE: If you have more than one external command with the same name, MS-DOS runs only one of them, according to the following order of precedence: .COM, .EXE, .BAT.

For example, your disk may include the files FORMAT.COM and FORMAT.BAT. If you type the external command FORMAT, MS-DOS always runs the program FORMAT.COM first. In order to run the batch file FORMAT.BAT, you have to place it in a separate directory and give a path along with the external command.

For example, if your FORMAT.BAT file is in a directory named \COMMANDS\BATCH and you want to run it, type the following:

```
\COMMANDS\BATCH\FORMAT
```

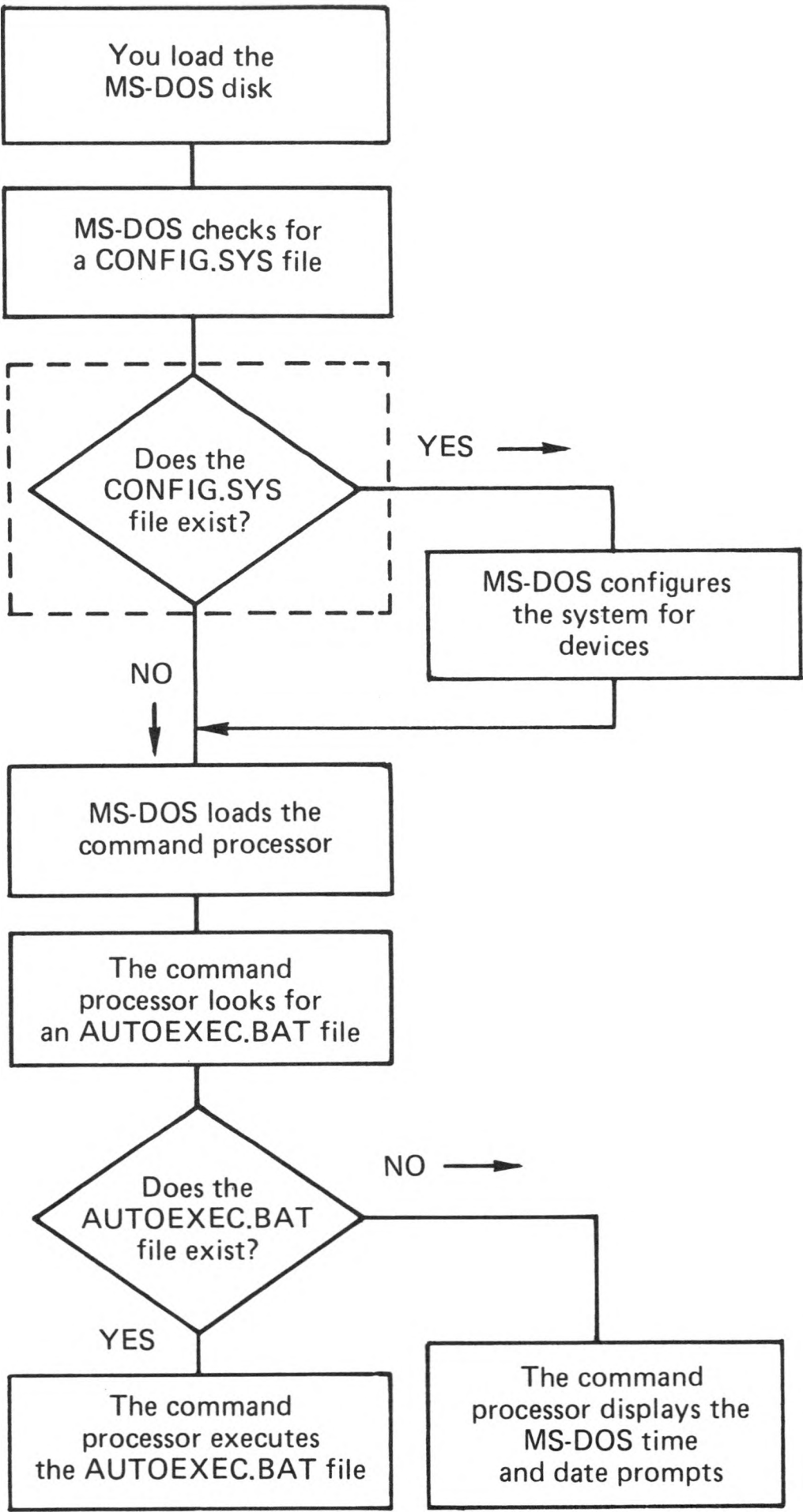
THE AUTOEXEC.BAT FILE

An AUTOEXEC.BAT file lets you run programs automatically when you start MS-DOS. This can be useful when you want to run a specific application under MS-DOS, and when you want MS-DOS to execute a batch program each time you start your PC. By using an AUTOEXEC.BAT file you can avoid loading two separate diskettes to perform these tasks.

When you start your PC, MS-DOS searches the root directory of the default disk drive for a file named AUTOEXEC.BAT. If it finds the AUTOEXEC.BAT file, MS-DOS immediately processes it, bypassing the date and time prompts. If MS-DOS does not find an AUTOEXEC.BAT file, the date and time prompts appear automatically.

NOTE: MS-DOS does not prompt you for a current date and time unless you include the DATE and TIME commands in your AUTOEXEC.BAT file. It is a good idea to add these two commands to your AUTOEXEC.BAT file unless you have a system that has a battery to maintain the correct date and time.

The following figure shows what happens when you start MS-DOS.



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How to Create an AUTOEXEC.BAT File

There are many things you can do with an AUTOEXEC.BAT file to help you use MS-DOS more efficiently. For instance, you can set the time and date, your path, and any other options that you plan to use on a regular basis.

NOTE: When you create your AUTOEXEC.BAT file, you must put it in the root directory of your MS-DOS disk.

If, for example, you want to automatically load BASIC and run a program called MENU each time you start MS-DOS, you can create an AUTOEXEC.BAT file as follows:

Step 1 Type the following command and press Enter.

```
COPY CON AUTOEXEC.BAT
```

This command tells MS-DOS to copy what you type from the keyboard into the AUTOEXEC.BAT file.

Step 2 Type the following lines:

```
DATE
```

```
TIME
```

```
PATH=C:\;C:\BIN;A:\
```

```
PROMPT [$P]
```

```
CLS
```

```
BASIC MENU
```

Step 3 After the last line, press Ctrl-Z and press Enter to copy these lines into the AUTOEXEC.BAT file.

Step 4 The MENU program now runs automatically whenever you start MS-DOS.

Once your AUTOEXEC.BAT file is set up as in this example, it performs the following actions when you start MS-DOS: it asks you to enter the date and time; it sets your command search path; and it sets your prompt to display the default drive and directory.

Finally, the AUTOEXEC.BAT file clears the screen and tells MS-DOS to load BASIC and run the MENU program. To run your own BASIC program, type its name in place of MENU in the example. In addition to BASIC programs, you can also put any MS-DOS command or series of commands in the AUTOEXEC.BAT file.

CREATING BATCH FILES WITH REPLACEABLE PARAMETERS

There may be times when you want to create a program and run it with different sets of data. This data can be stored in various MS-DOS files.

With MS-DOS, you can create a batch (.BAT) file with replaceable (dummy) parameters that are command options that you define. These parameters, named %0-%9, hold the places for the values that you supply when you give the batch command.

Replaceable parameters make batch files more flexible and easier to use. For example, you can create a batch file called SORTER.BAT that sorts a file containing a specific sequence of characters or strings. Each time you run the SORTER batch file, you tell MS-DOS which string you want, which file to search to find that string, and which temporary file to use for sorting. SORTER then prints the resulting list.

Step 1 To create the SORTER.BAT file, type the following command and press the Enter key:

```
COPY CON SORTER.BAT
```

Step 2 Now type the following lines:

TYPE %2 | FIND "%1" %3

TYPE %3 | SORT PRN

DEL %3

Step 3 To save the batch file, press Ctrl-Z and then press Enter.

The batch file SORTER.BAT now consists of three command lines and is on the disk in the default drive.

When you execute the file, MS-DOS sequentially replaces %1, %2, and %3 with the parameters you supply. If you use the dummy parameter %0, MS-DOS always replaces it with the drive name (if specified) and the file name of the batch file (for example, SORTER).

NOTE: You can specify up to 10 replaceable parameters (%0-%9). If you want to use more than 10, refer to the SHIFT command later in this section.

NOTE: If you use a percent sign as part of a file name within a batch file, you must type it twice. For example, to specify the file ABC%.EXE, you must type it as ABC%%.EXE in the batch file.

How to Use Named Parameters in a Batch File

In addition to the 10 numeric replaceable parameters, you can use named parameters in batch files. Named parameters allow you to define your replaceable parameters by name instead of by number. When referenced in a file, the name of a replaceable parameter is placed between two percent signs.

Named parameters differ from replaceable parameters in that you do not specify their values on the command line. Instead, MS-DOS retrieves the value of each named parameter from its environment.

You can use the MS-DOS SET command to set the value of a named parameter before you run your batch file, or you can include the SET command in your batch file.

For example, you may want to create a batch file called MYDEL.BAT, that moves a file you want to delete into a separate directory. You might want to use this method to make sure that you do not delete files accidentally from an important directory.

The file MYDEL.BAT might contain the following lines:

```
ECHO OFF  
  
ECHO BEFORE YOU USE THIS BATCH FILE, YOU MUST  
ECHO SPECIFY THE DIRECTORY BY TYPING THE  
ECHO FOLLOWING COMMAND AT THE MS-DOS PROMPT:  
ECHO SET DELDIR=DIRECTORY  
  
ECHO PRESS CTRL-C TO EXIT IF YOU HAVE NOT  
ECHO SET DELDIR OR IF DELDIR DOES NOT EXIST.  
  
PAUSE  
  
COPY %1 %DELDIR%  
  
DEL %1  
  
DIR /W %DELDIR%  
  
ECHO ALL DONE.
```

For this MYDEL.BAT file to work, you must create a directory named DELETED. The following command line sets the directory name to deleted:

```
SET DELDIR=\DELETED
```

Now, to move the file REPORT23.JUN to the DELETED directory, type the following:

```
MYDEL REPORT23.JUN
```

The batch file automatically replaces the %DELDIR% parameter with the directory named DELETED.

You may find named parameters easier to use than replaceable parameters because you do not have to include as much information on the command line. For example, with MYDEL.BAT you do not have to type the directory name on the command line, yet you can change the name of the directory without having to edit the batch file.

How to Run a Batch File With Replaceable Parameters

To run the batch file SORTER.BAT, type the batch file name followed by the parameters that you want MS-DOS to substitute for %1, %2, and %3.

If you have a file named CUSTOMER on the disk in drive A that lists your customers' names and regions, the file might look something like this:

Shores, Betty	north
Moynihan, Ann	south
Kraig, Heidy	north
Martin, Pete	east
Lennon, Patrick	south
Pai, Fernando	north
Evans, Rick	west
Moss, Melissa	north

To print an alphabetical list of the customers in the north, you can run the SORTER batch file, with the appropriate parameters, by typing the following command and then pressing the Enter key:

```
SORTER NORTH A:CUSTOMER TEMP.FIL
```

The output on the printer should look like this:

Kraig, Heidy	north
Moss, Melissa	north
Pai, Fernando	north
Shores, Betty	north

The following shows how MS-DOS replaces each of the parameters in the previous example:

```
BATCH FILENAME (%0) SORTER
```

```
PARAMETER1 (%1) NORTH
```

```
PARAMETER2 (%2) A:CUSTOMER
```

```
PARAMETER3 (%3) TEMP.FIL
```

The result is the same as if you had typed each of the commands in SORTER with its parameters as follows:

```
TYPE A:CUSTOMER | FIND "NORTH" TEMP.FIL
```

```
TYPE TEMP.FIL | SORT PRN
```

```
DEL TEMP.FIL
```

HOW TO USE TEMPORARY FILES

When using batch files, you may often want to use a temporary file to hold your work. You can use the same name each time you wanted to use a temporary file.

However, if you are using more than one batch file that uses the same temporary file, you might lose the contents of this temporary file. To avoid this problem, use a replaceable parameter to specify the name of the temporary file. Then each time you run the batch file, you can substitute a unique file name, and you do not have to worry about information from one batch file getting into another.

It is also a good idea to delete temporary files once you finish using them. Otherwise, these files will eventually take up all the space on your disk.

BATCH PROCESSING COMMANDS

You can add power and flexibility to your batch programs by using batch processing commands. The following is a list of these batch commands and what they do:

CALL

Calls one batch file from another without ending the first batch file.

ECHO

Turns the batch file echo (display on screen) feature on or off or displays the current setting.

FOR

Performs a command for a set of files.

GOTO

Processes commands starting with the line after the specified label.

IF

Performs a command if a condition is met.

PAUSE

Pauses during the processing of a batch file until a key is pressed.

REM

Displays a comment in a batch file.

SHIFT

Increases the number of replaceable parameters in a batch process.

CALL

PURPOSE: Calls one batch file from another without ending the first batch file.

FORMAT: CALL [drive:][path] batchfile [argument]

where BATCHFILE is the batch file you want to call, and ARGUMENT is the command in the batch file that will be run following BATCHFILE.

COMMENTS: BATCHFILE must have a file extension of .BAT.

When BATCHFILE terminates, the calling batch file resumes running at ARGUMENT. If ARGUMENT is omitted, the calling batch file resumes running at the command immediately following the CALL command.

NOTES: Do not use pipes and redirection symbols with the CALL command.

A batch file can make a recursive call to itself, but there should be a termination condition that is eventually met.

EXAMPLES: To run CHECKNEW.BAT from another batch file, you would use the following command with the first batch file:

CALL CHECKNEW

ECHO

ECHO

PURPOSE: Turns the batch echo feature on and off.

FORMAT: ECHO [on]

or

ECHO [off]

or

ECHO [message]

COMMENTS: Normally, commands in a batch file are displayed (echoed) on the screen when they are received by MS-DOS. You can turn off this feature by using the OFF option with the ECHO command. You can turn the echo feature back on by using the ON option with ECHO.

If you do not specify ON or OFF, ECHO displays the current setting.

The command, ECHO MESSAGE (where MESSAGE is a line of text), is only useful if echo is off and if you are using a batch file. If, in your batch file, you type the ECHO command followed by a message, you can print messages on your screen. You can also put several ECHO MESSAGE commands in your batch file to display a message that is several lines in length.

An at (@) sign placed in front of the command line in a batch file prevents that line from echoing.

EXAMPLES: The following is an example of a batch file message of more than one line:

```
ECHO OFF  
  
ECHO THIS BATCH FILE FORMATS  
  
ECHO AND CHECKS NEW DISKS
```

If you want to turn echo off, and do not want the command itself to be echoed, include the @ sign before the command line:

```
@ECHO OFF
```

FOR

PURPOSE: Performs a command for a set of files.

FORMAT: FOR %%c in set do command
(for batch processing)

FOR %C in set do command
(for interactive processing)

COMMENTS: To avoid confusion with the %0 to %9 batch parameters, the variable C can be any character except 0, 1, 2, 3, ..., 9.

SET IS (ITEM*)

This command sequentially sets the %%c variable to each member of SET, and uses the variable to evaluate COMMAND. If a member of SET is an expression involving a wildcard (* or ?), then the variable is set to each matching item from the disk. In this case, only one such item is in SET, so the command ignores any item other than the first.

EXAMPLES: The following example assigns the variable %F to any files ending with .ASM in the working directory:

FOR %%F IN (*.ASM) DO MASM %%F

It then executes a command of the following form:

MASM FILENAME.ASM

File name could be any one of the following:

INVOICE.ASM

RECEIPTS.ASM

TAXES.ASM

The following example assigns the variable %%F to the files named REPORT, MEMO, and ADDRESS; it then deletes each of these files:

FOR %%F IN (REPORT MEMO ADDRESS) DO DEL %%F

FOR

You must use two percent signs (%%) so that one remains after the batch parameter (%0 to %9) processing is complete. If you had only %F, instead of %%F, the batch parameter processor would see the %, look at the F, decide that %F was an error (a bad parameter reference), and throw out the %F so that the FOR command would never see it.

Note that if you are using the FOR command outside of a batch file, you should use only one percent sign.

GOTO

PURPOSE: Processes commands starting with the line after the specified label.

FORMAT: GOTO [:]label

COMMENTS: GOTO lets you take commands from the batch file beginning with the line after the label, where a label is defined as the characters following GOTO. This label can include spaces, but not other separators, such as semicolons or equal signs. If your batch file does not contain the label, the batch process terminates.

NOTE: Any line in a batch file that starts with a colon (:) is ignored during batch processing.

EXAMPLES: The following example sends the program processor to the label named END -- only if no errors occur when you format the diskette in drive A:

:BEGIN

ECHO OFF

FORMAT A: /S

IF ERRORLEVEL 0 GOTO END

ECHO AN ERROR OCCURRED DURING FORMATTING.

:END

ECHO END OF BATCH FILE.

IF

IF

PURPOSE: Performs a command based on the result of a condition.

FORMAT: IF [not] errorlevel number command

or

IF [not] string1 == string2 command

or

IF [not] exist filename command

COMMENTS: The IF statement allows conditional execution of commands. When the condition is true, MS-DOS executes the command; otherwise, it ignores the command.

The conditions are described as follows:

errorlevel number

True if, and only if, the previous program executed by COMMAND.COM had an exit code equal to, or greater than, number. (When a program finishes, it returns to an exit code via MS-DOS). You can use this condition to perform other tasks that are based on the previous programs' exit code.

string1 == string2

True if, and only if, string1 and string2 are identical after parameter substitution. Strings may not contain separators, such as commas, semicolons, equal signs, or spaces.

exist filename

True if, and only if, filename exists.

If you specify the NOT parameter, MS-DOS executes the command when the condition is false.

NOTE: For more information about exit code returned by an MS-DOS command, refer to the specific command in Section 3 of the *MS-DOS Reference Manual*, (Order No. HU95).

EXAMPLES: The following example prints the message "can't find datafile" if the file PRODUCT.DAT does not exist on the disk:

```
IF NOT EXIST PRODUCT.DAT ECHO CAN'T FIND DATAFILE
```

The following example sends the program processor to the label named END -- only if no errors occur when you format the diskette in drive A.

```
:BEGIN
```

```
ECHO OFF
```

```
FORMAT A: /S
```

```
IF ERRORLEVEL 0 GOTO END
```

```
ECHO AN ERROR OCCURRED DURING FORMATTING.
```

```
:END
```

```
ECHO END OF BATCH FILE.
```

PAUSE

PAUSE

PURPOSE: Suspends execution of a batch file.

FORMAT: PAUSE [comment]

COMMENTS: When a batch file is running, you may need to change a diskette or perform some other action. The PAUSE command suspends execution of the batch file until you press any key, unless you press the Ctrl-C sequence.

When the command processor encounters PAUSE, it displays the following message:

Strike a key when ready...

If you press Ctrl-C, MS-DOS displays the following prompt:

Terminate batch job (Y/N)?

If you type Y (for Yes), the batch file ends and control returns to the operating system. Therefore, you can use PAUSE to divide a batch file into pieces that allow you to end the batch command file at any intermediate point.

The [comment] parameter is useful when you want to display a special message. Unless echo is off, PAUSE displays with comment before the "Strike a key" message.

NOTE: The pause and comment line of your batch file does not appear if echo is off.

EXAMPLES: You want a program to display a message that asks the user to change diskettes in one of the drives. To do this you might use the following command:

PAUSE PLEASE PUT A NEW DISKETTE INTO DRIVE A

If echo is on, this line precedes the "Strike a key" message when you run the batch file.

REM

PURPOSE: During execution of a batch file, displays remarks that are on the same line as the REM command in that batch file.

FORMAT: REM [comment]

COMMENTS: The [comment] parameter is a line of text that helps you identify and remember what your batch file does.

The only separators allowed in the comment are spaces, tabs, and commas.

You can use REM without a comment to add spacing for readability.

NOTE: If echo is off, the comment is not displayed.

EXAMPLES: The following example shows a batch file that uses remarks for both explanation and spacing:

```
REM THIS FILE FORMATS AND CHECK NEW DISKS
```

```
REM IT IS NAMED CHECKNEW.BAT
```

```
REM
```

```
PAUSE INSERT NEW DISKETTE IN DRIVE B
```

```
FORMAT B:
```

```
CHKDSK B:
```

SHIFT

SHIFT

PURPOSE: Lets you change the position of replaceable parameters in batch file processing.

FORMAT: SHIFT

COMMENTS: Usually, command files are limited to handling 10 parameters, %0 to %9. By using the SHIFT command, you can access more than 10 parameters. This means that if there are more than 10 parameters given on a command line, those that appear after the tenth (%9) are shifted one at a time into %9.

You can use the SHIFT command even if you have less than 10 parameters.

WARNING

There is no backward shift command. Once you have executed SHIFT, you cannot recover the first parameter (%0) that existed before the shift.

EXAMPLES: The following file, called MYCOPY.BAT, shows how to use the SHIFT command with any number of parameters. It copies a list of files to a specific directory.

```
REM MYCOPY.BAT COPIES
REM ANY NUMBER OF FILES
REM TO A DIRECTORY.
REM THE COMMAND IS
REM MYCOPY DIR FILES
SET TODIR = %1
:ONE
SHIFT
IF "%1"==" " GOTO TWO
COPY %1 %TODIR%
GOTO ONE
:TWO
SET TODIR=
ECHO ALL DONE
```


Section 9

LEARNING ABOUT COMMANDS

In this section:	See page
Types of MS-DOS Commands.....	9-2
Internal Commands.....	9-2
Pathnames With Internal Commands.....	9-2
External Commands.....	9-4
Using Paths With External Commands.....	9-5
Redirecting Command Input and Output.....	9-6
Redirecting Output.....	9-6
Redirecting Input.....	9-7
Filters and Pipes.....	9-7
Filter Commands.....	9-7
Command Pipes.....	9-8
Using Redirection Symbols With Pipes.....	9-8

Summary	In this section you learn about internal and external MS-DOS commands, redirecting input and output, and command grouping symbols.
---------	--

TYPES OF MS-DOS COMMANDS

There are two types of MS-DOS commands:

- Internal commands
- External commands.

Internal Commands

Internal commands are the simplest, most commonly used commands. When you list the directory on your MS-DOS disk, you cannot see these commands because they are part of a file named COMMAND.COM. When you type internal commands, MS-DOS performs them immediately. This is because they were loaded into your PC's memory when you started MS-DOS. Following is a list of the MS-DOS internal commands:

BREAK	DEL	MKDIR	SET
CHCP	DIR	PATH	SHIFT
CHDIR	ECHO	PAUSE	TIME
CLS	EXIT	PROMPT	TYPE
COPY	FOR	REN	VER
CTTY	GOTO	REN	VERIFY
DATE	IF	RMDIR	VOL

Pathnames With Internal Commands

Some internal commands can use paths and pathnames. Specifically, the four commands, COPY, DIR, DEL, and TYPE, have greater flexibility when you specify a pathname after the command.

The formats of these commands are as follows:

COPY [pathname][pathname]

If the second pathname is a directory (a path), MS-DOS copies all of the files you specify in the first pathname into that directory, as in the following example:

```
COPY \USER\PETE\*.* SALES
```

DEL [pathname]

If the pathname is a directory (a path), all of the files in that directory are deleted. If you try to delete a path, MS-DOS displays the prompt "Are you sure (Y/N)?". Type Y (for Yes) to complete the command, or N (for No) to stop the command. Example:

```
DEL\USER\PETE
```

DIR [pathname]

The following command displays the directory for a specific path:

```
DIR \USER\PETE
```

TYPE [pathname]

You must specify a pathname (or file name) for this command. MS-DOS then displays this file on your screen in response to the type command. Example:

```
TYPE \USER\EMILY\REPORT.NOV
```

External Commands

Any file name with an extension of .COM, .EXE, or .BAT is considered an external command. For example, files such as FORMAT.COM and DISKCOPY.COM are external commands. Because all external commands are also files, you can create new commands and add them to MS-DOS. Programs that you create with most languages (including Assembly language) are .EXE (executable) files. Note, however, that when you use an external command, you do not need to type its file name extension.

NOTE: If you have more than one external command with the same name, MS-DOS only runs one of them, according to the following order of precedence: .COM, .EXE, .BAT.

To illustrate this precedence, suppose your disk contains the files FORMAT.COM and FORMAT.BAT. If you type the external command FORMAT, MS-DOS always runs the program FORMAT.COM first, and does not run the FORMAT.BAT file at all.

The following external commands are described in Section 3 of the *MS-DOS Reference Manual* (Order No. HU95):

APPEND	FASTOPEN	LABEL	RESTORE
ASSIGN	FDISK	MODE	SELECT
ATTRIB	FIND	MORE	SHARE
BACKUP	FORMAT	NLSFUNC	SORT
CHKDSK	FREQ	PARK	SUBST
COMMAND	GRAFTABL	PRINT	SYS
COMP	GRAPHICS	RECOVER	TREE
DISKCOMP	JOIN	REPLACE	XCOPY
DISKCOPY	KEYB		

Using Paths With External Commands

Before MS-DOS can run external commands, it must read them into memory from the disk. When you give an external command, MS-DOS immediately checks your working directory to find that command. If it is not there, you must tell MS-DOS which directory the external command is in. You do this with the PATH command.

When you are working with more than one directory, you may find it more convenient to put all of the MS-DOS external commands in one directory. Then, when it needs them, MS-DOS can quickly find the external commands at one location.

Suppose, for example, that you are in a working directory named \USER\PROG and that the MS-DOS external commands are in \BIN. To find the FORMAT command, you must tell MS-DOS to choose the \BIN path, as in the following command:

```
PATH \BIN
```

You only need to specify this path once during each PC session. Also, if you want to know what the current path is, you can type the PATH command by itself. In response, MS-DOS displays the working path on the screen. You can automatically set your path when you start MS-DOS by including the PATH command in the AUTOEXEC.BAT file. For more information on the AUTOEXEC.BAT file, refer to Section 8.

REDIRECTING COMMAND INPUT AND OUTPUT

Usually, MS-DOS receives input from the keyboard and sends its output to the screen. You can, however, redirect this flow of command input and output. For instance, you may want input to come from a file instead of from the keyboard, and you may want output from a command to go to a file or line printer instead of to the screen. With redirection symbols, you can also create pipes that let the output from one command become the input for another command.

Redirecting Output

By default, most commands send output to your screen. If you want to change this and send the output to a file, use a greater-than sign (>) in your command. For example, the following command displays a directory listing of the disk in the default drive:

```
DIR
```

The DIR command can send this output to a file named CONTENTS if you type the following:

```
DIR > CONTENTS
```

If the CONTENTS file does not exist, MS-DOS creates it and stores your directory listing there. If CONTENTS does exist, MS-DOS replaces what is in the file with the new data.

If you want to append your directory or add one file to another (instead of replacing the entire file), you can use two greater-than signs (>>) to tell MS-DOS to append the output of the command (such as a directory listing) to the end of a specified file. For example, the following command appends your directory listing to an existing file named CONTENTS:

```
DIR >> CONTENTS
```

If CONTENTS does not exist, MS-DOS creates it.

Redirecting Input

Often, it is useful to have input for a command come from a file instead of from the keyboard. This is possible in MS-DOS by using a less-than (<) sign in your command. For example, the following command sorts the file names and sends the sorted output to a file called NAMELIST:

```
SORT <NAMES> NAMELIST
```

Filters and Pipes

Filter Commands

A filter is a command that reads your input, transforms it in some way, and then outputs it to your screen. In this manner, the input is "filtered" by the program.

MS-DOS filters include: FIND, MORE, and SORT. Their functions are:

FIND: Searches for text in a file.

MORE: Displays the contents of a file one screenful at a time.

SORT: Alphabetically sorts the contents of a file.

You can redirect the output from a filter into a file, or use it as input for another filter by using pipes. The following subsection explains how filters are piped together.

Command Pipes

To use the output from one command as the input for another, you can pipe the commands to MS-DOS. Piping is done by separating commands with the pipe symbol, which is a vertical bar (|).

NOTE: (|) may be a broken vertical bar on some keyboards.

The following command, for example, displays an alphabetically sorted listing of your directory on the screen:

```
DIR | SORT
```

The pipe sends all output generated by the DIR command (on the left side of the bar) as input to the SORT command (on the right side of the bar).

Using Redirection Symbols With Pipes

You can also use piping with redirection symbols to send the output to a file. For example, the following command creates a file named DIRECT.LST on your default drive:

```
DIR | SORT > DIRECT.LST
```

The DIRECT.LST file now contains a sorted listing of the directory on the default drive.

You can also specify a drive other than the default drive. For example, to send the sorted data to a file named DIRECT.LST on drive B, type the following:

```
DIR | SORT > B:DIRECT.LST
```

You can use more than one pipe on a command line. The following command, for instance, sorts your directory, shows it to you one screen at a time, and displays the message **--More--** at the bottom of your screen when there is more output to be seen:

```
DIR | SORT | MORE
```


Section 10 USING THE MENU MANAGER AND DOS-HELP

In this section:	See page
Using the Menu Manager.....	10-3
Using the Applications Menu.....	10-4
Using DOS Commands Through the Menu Manager.....	10-4
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Summary In this section you learn how to use the Menu
 Manager and SHELUTIL utility.

The Menu Manager provides an easy way to use DOS. DOS-Help provides an on-screen reference guide to DOS commands. These on-screen facilities, along with this manual and your PC Owner's manual, provide the basic information you need to use your PC with DOS.

When you use your PC, you can choose to use the DOS operating system directly, or you can use it through the Menu Manager. If you are unfamiliar with DOS commands, the Menu Manager simplifies them by providing a "fill-in-the-blanks" format. You can also set up an applications menu, so that calling a program is a matter of choosing an item rather than typing a command name. The Menu Manager provides a number of other useful features, such as the display of the date and time in the upper righthand corner of the screen, and the ability to program the function keys to perform commands you use frequently. You can leave the Main Menu of the Menu Manager whenever you want, to display the regular DOS prompt.

If you need help with an individual DOS command, you can call DOS-Help for on-screen reference, whether you are using the Menu Manager or DOS directly. The DOS-Help utility provides quick reference information on DOS commands through definitions and illustrative examples.

You use a utility program called SHELUTIL to install or delete, enable or disable the Menu Manager.

If you decide that you do not want to use the Menu Manager, you can disable it temporarily or delete it entirely by using the SHELUTIL program. You can still use DOS-Help, even if you delete the Menu Manager from your system. If you decide to delete DOS-Help as well, use the DEL or ERASE command to delete the DOS-Help files. Refer to Appendix F in the *MS-DOS Reference Manual* (Order No. HU95), for a list of the DOS-Help file names.

NOTE: The Menu Manager does not work with a composite monochrome graphics monitor (one with a round video connector instead of a 9-pin connector). Refer to "Using SHELUTIL" in this section for instructions on deleting the Menu Manager.

If you have a composite monochrome graphics monitor, you can use DOS-Help only if you use the MODE BW80 command during each session. Refer to "Using DOS-Help" in this section for more information.

USING THE MENU MANAGER

If the Menu Manager is enabled, its Main Menu appears on the screen whenever you start your PC, immediately after the PC and DOS copyright messages.

The Main Menu provides these options:

1. Select an application from the applications menu.
 2. Select an MS-DOS command for use.
 3. Create an applications menu.
 4. Set the level of on-screen assistance required.
 5. Define the use of the function keys.
 6. Set the time and date.
 7. Enable or disable the display of the date and time banner.
- F1. Application incompatibility information.
- F9. On-Screen DOS-Help.
- ESC. Exit to DOS.

Using the Applications Menu

Option 1 on the Main Menu displays a menu of applications. You create the applications menu using option 3.

Follow these steps to select an application, starting from the Main Menu:

1. Type 1 and press Enter to select option 1.
2. Press PgDn, if necessary, to display the page containing the menu selection you want.
3. Type the number corresponding to the application you want to use, and press Enter.

If the application program is not found, a message appears, stating that it is not present, and you are prompted to insert the proper diskette.

When you are finished using an applications program, you return to the Applications Menu. Press Esc to return to the Main Menu.

Using DOS Commands Through the Menu Manager

Option 2 on the Main Menu displays a menu of MS-DOS commands. You can select a command in one of two ways:

1. By moving the cursor to the command with the arrow keys, and pressing Enter.
2. By typing the command name at the top of the screen, and pressing Enter.

When you select a command, a screen appears, providing a format for entering the command you have chosen. You are guided through the command by prompts.

For example, the following prompts are provided to help you fill in the options for the COPY command:

Source File	
Drive: _	
Pathname: _____	
Name: _____	
Destination File	
Drive: _	
Pathname: _____	
Name: _____	
Do you want to verify the copied files (y/n)?: _	

Required parameters are highlighted (in this case, the two file names). The following keys help you in using DOS prompt screens:

- ↓ To move to the next field
- ↑ To move to the previous field
- ← To delete the previous character.
- ESC To cancel and exit the screen
- F9 To display DOS-Help about the current command
- END To execute the entries you have made.

Creating an Applications Menu

Option 3 from the Main Menu of the Menu Manager creates an application menu for yourself or other users of your PC.

When adding applications to the menu, you must specify:

- A name for the application. (The name can be different from the application name for the program.)
- An optional, short description which appears on a "help" screen.

For example, if you have an application that prepares individual federal income tax returns, you might choose the menu name IRS, but on the help screen use "1040 Federal Tax Return Preparation (individual)."

- The disk drive from which the program loads.
- The name that DOS uses to find and load the application.

The Menu Manager allows you to create a batch file, if needed, to use with your program.

The Menu Manager also provides you with help screens to assist you in creating the application menu.

The following options are available to help you build a new applications menu or modify an existing one:

1. Add an application to the existing menu.
2. Change information about existing selections.
3. Delete an application from the existing menu.
4. Build a new applications menu.

Only one applications menu can be associated with a directory (or with a hard disk having only a root directory), building a new applications menu destroys any existing menu.

Setting the DOS Assistance Level

Option 4 on the Main Menu allows you to set the level of assistance you want for DOS commands. The levels range from level 1 (the least amount of help) to level 4 (the most extensive help). The default setting is level 4.

The following levels of assistance are available:

- Level 1 PROFICIENT: provides no prompts or guidance.
- Level 2 EXPERIENCED: provides a window with DOS command syntax upon request, or after an error.
- Level 3 MEDIUM: provides a screen with DOS command syntax and examples upon request, or after an error.
- Level 4 NOVICE: provides menus and screens for the maximum amount of assistance.

Follow these steps to change the assistance level from the Main Menu:

1. Type 4 and press Enter to select Option 4.
2. Type the number corresponding to the level of assistance you want, and press Enter.
3. Press any key to accept the chosen level of assistance and return to DOS.
4. Press function key F10 to redisplay the Menu Manager (if desired).

Defining Function Keys

Option 5 on the Main Menu allows you to assign commands or actions to the function keys on your keyboard.

Once you have assigned functions to the keys, they are saved on the Menu Manager disk so that you can use them during any session, without having to reprogram them.

NOTE: You can only use the key assignments you make from the DOS level, to avoid conflicts with key assignments in applications programs.

Keys F8, F9, and F10 are reserved for the use of the Menu Manager. You can use any other function key on your keyboard (F1 through F7, and F11 through F30, if they are available).

NOTE: DOS uses F1 through F6 for editing functions on the DOS command line. You may wish to read Section 5 in the *MS-DOS Reference Manual* (Order No. HU95), before you reprogram these function keys.

You can assign a string of characters, such as all or part of a DOS command, or an Escape key sequence to a function key.

The function keys you define are no longer available when the Menu Manager is disabled or deleted.

Changing the Date and Time

Option 6 on the Main Menu allows you to reset the date and time. The Menu Manager provides a series of screens on which you can fill in the date and then the time. These screens are the same as those provided by the Menu Manager for the DATE and TIME commands individually, except that they automatically display in order.

Follow these steps to change the date and time from the Menu Manager:

1. Type 6 and press Enter to select option 6.
2. Fill in the month, day, and year.
3. Press END to accept your date entries.
4. Press any key to continue to the time screen.
5. Fill in the hour and minute (and the seconds and hundredths of a second, if desired).
6. Press END to accept your time entries.
7. Press any key to return to the Main Menu.

Displaying the Date and Time

A line can be displayed in the upper righthand corner of the screen, including the day of the week, the date, and the time (on a 24-hour clock).

Option 7 turns the date and time line on and off. If the line is currently displayed, type 7 and press Enter to remove it. If the line is not displayed, type 7 and press Enter to display it again.

The date and time line always appears, whether you are using DOS directly or through the Menu Manager, unless you disable it.

NOTE: The date and time line is automatically removed when you use an application program.

The Menu Manager uses the same date and time as your PC. There are a number of factors that affect the date and time:

- If you do not have a battery-powered clock, the time is not saved when you power off the PC. Therefore, each time you turn on your PC, the date begins again at Jan-01-1980 and the time restarts at 00:00:00.00.
- If you have a battery-powered clock, the current date and time are retained, even if you turn off your PC.
- Each time you start up your PC you are prompted to type the date and time (unless you have an AUTOEXEC.BAT file that does not contain the DATE and TIME commands).
- You can change the time and date at any point during a session by using the DATE and TIME commands, either from the system prompt, or with option 6 on the Menu Manager.

Resolving Application Program Conflicts

If there is a conflict between the Menu Manager and an applications program you are using, press function key F1 to display on-screen instructions for resolving the difficulty.

Displaying On-Screen Help

You can access the DOS-Help utility at any time from the Main Menu by pressing function key F9. The first screen that appears is a list of DOS commands from which you can choose for more information. For more information about DOS-Help, refer to "Using DOS-Help" in this section.

Press Esc from DOS-Help to return to the Main Menu.

Exiting to DOS

To exit the Menu Manager and display the DOS system prompt, press Esc. A line appears at the top of the screen, providing the following items of information (depending on the current assistance level, and the options you have enabled):

A:\
C:\

Indicates the current drive designation: for example, diskette drive A or hard disk C.

Day, Date, Time

If enabled, the current day of the week, date, and time appear. If the date and time are incorrect, you can change them by using the DATE and TIME commands, or option 6 of the Menu Manager.

Command & F8 = Prompt

While you are typing a DOS command at a DOS prompt, you can request assistance in typing the command options. Type the command name and press function key F8.

NOTE: The Menu Manager also automatically activates DOS assistance whenever you type a command that contains an error.

F8 = Command List

If you need help remembering the name of a command, press function key F8 at the DOS prompt for a list of the available commands. You can select the command you want by moving the cursor to it, or by typing it.

F9 = Online HELP

If you want a description of a DOS command, press function key F9 at the DOS prompt. If you press function key F9 at the DOS prompt without typing a command, a list of DOS commands appear for you to choose from. If you type a command name and press function key F9, help is displayed about the command you typed. Refer to "Using DOS-Help" in this section for further information.

When you are finished with DOS-Help, press Esc. You return to the exact place from which you requested DOS-Help.

F10 = Main Menu

If you want to return to the Main Menu of the Menu Manager, press function key F10 at the DOS prompt.

USING SHELUTIL

The SHELUTIL program is a menu-driven utility that manages several activities related to the Menu Manager. You can use SHELUTIL to:

- Install or delete the Menu Manager files on a disk.
- Enable or disable the Menu Manager when its files are installed on the disk you are using.
- Set up your monitor for use with the Menu Manager.

If you use SHELUTIL to delete the Menu Manager, both the Menu Manager and SHELUTIL are completely erased from the working diskette or the hard disk you designate.

If you delete the Menu Manager from a disk, you can install it later with the install option from the Menu Manager/Help Diskette. If you only want to disable the Menu Manager temporarily, disable it instead of deleting it.

NOTE: The SHELUTIL program only deletes the Menu Manager. To delete DOS-Help, you must delete the DOS-Help files. Refer to "Using DOS-Help" in this section for more information.

After making a change to the Menu Manager, you must reboot your PC to make the change effective.

To start the SHELUTIL program:

1. Use the DIR command to determine if the current diskette or directory contains the file SHELUTIL.COM. If it does not, insert your working copy of the Menu Manager/Help Diskette, or another diskette that contains SHELUTIL and the Menu Manager files, in diskette drive A.
2. Type SHELUTIL at the drive A DOS prompt, and press the Enter key. The following menu appears:

This program permits you to do the following:

1. Enable Bull Menu Manager
2. Disable Bull Menu Manager
3. Install Bull Menu Manager and Help files on a system disk
4. Delete Bull Menu Manager from a system disk
5. Set up Monitor for Bull Menu Manager
6. Install Bull Menu Manager on a system disk
7. Install the Help files

<ESC> to CANCEL

Press your selection number and Enter:

NOTE: If SHELUTIL.COM is not in the current directory or in the indicated directory, the following message appears:

Bad command or file name

Enabling the Menu Manager

To automatically display the Main Menu of the Menu Manager when you start your PC, your startup disk must contain the Menu Manager files, with the Menu Manager enabled.

1. If you are enabling the Menu Manager on a diskette, remove any write-protection before proceeding.
2. Enter 1 at the SHELUTIL menu, and press Enter. The following prompt appears:

Type in the disk DRIVE LETTER and Enter with
Bull Menu Manager:

3. Enter the letter of the drive where you want to activate the Menu Manager, and press Enter.

NOTE: The Menu Manager files must already exist on the indicated drive.

The following prompt appears:

Press any key to continue <ESC> to CANCEL

4. Press any character key on the keyboard. The following message appears, followed by the DOS prompt:

You must restart your system with the
modified Bull Menu Manager disk to make the
change effective

5. Press Ctrl-Alt-Del to restart your PC with the Menu Manager enabled.
6. If you are working with a diskette, write-protect it again.

Disabling the Menu Manager

If you want to prevent the Menu Manager from automatically displaying when you start your PC, disable the Menu Manager on your startup disk.

1. If you are disabling the Menu Manager on a diskette, remove any write-protection before proceeding.
2. Enter 2 at the SHELUTIL menu, and press Enter. The following message appears:

Type in the disk DRIVE LETTER and Enter with
Bull Menu Manager:

3. Enter the letter of the drive where you want to disable the Menu Manager, and press Enter. The following message appears:

Press any key to continue <ESC> to CANCEL

4. Press any character key on the keyboard. The following message appears, followed by the DOS prompt:

You must restart your system with the
modified Bull Menu Manager disk to make the
change effective

5. Press Ctrl-Alt-Del to restart your PC with the Menu Manager disabled.
6. If you are working with a diskette, write-protect it again.

Installing the Menu Manager/Help

To install the Menu Manager/Help on a disk that contains the DOS system files:

1. Remove any write-protection before proceeding.
2. Enter 3 at the SHELUTIL menu, and press Enter. The following message appears:

Type in the Source disk DRIVE LETTER and
Enter with Bull Menu Manager/Help:

3. Enter the letter of the drive that currently contains the Menu Manager files, and press Enter. The following message appears:

Type in the Destination disk DRIVE LETTER
and Enter for Bull Menu Manager/Help:

4. Enter the letter of the drive where you want to install the Menu Manager, and press Enter. The following message appears:

Bull Menu Manager in destination
disk, if present, will be deleted

Press any key to continue <ESC> to CANCEL

5. Press any character key on the keyboard.

If you are installing the Menu Manager on the current drive for the first time. Skip to step 6.

If the Menu Manager already exists on the current drive, the following message appears:

Do you wish to preserve the present
definition of function keys and applications
on the destination drive (y/n)?:

If you want to retain the current applications menu and function key settings, enter Y, and press Enter.

If you do not want to retain the settings, enter N, and press Enter.

6. A set of messages similar to the following appears, depending on the source drive letter you designated:

```
Copying file  A:\shelldrv.sys
Copying file  A:\shellhlp.dta
Copying file  A:\shellres.exe
Copying file  A:\shell11.ovr
Copying file  A:\shell12.ovr
Copying file  A:\shell13.ovr
Copying file  A:\shell14.ovr
Copying file  A:\shell15.ovr
Copying file  A:\shelutil.com
Copying file  A:\time.sys
Copying file  A:\wtime.com
```

NOTE: The file SHELLHLP.DTA is not copied if you are retaining previous settings.

```
Help files in destination disk, if present
will be deleted. Press any key to continue.
<ESC> to cancel
```

7. Press any character key on the keyboard. The Help files are copied to the destination disk.
8. Press Ctrl-Alt-Del to restart your PC with the Menu Manager installed.
9. If you are working with a diskette, write-protect it again.

Deleting the Menu Manager and Its Files

To delete the Menu Manager and all of its files from a disk:

1. If you are deleting the Menu Manager from a diskette, remove any write-protection before proceeding.
2. Enter 4 at the SHELUTIL menu, and press Enter. The following message appears:

Type in the disk DRIVE LETTER and Enter for Deleting Bull Menu Manager:

3. Enter the letter of the drive from which you want to delete the Menu Manager files, and press Enter. The following message appears:

Press any key to continue <ESC> to CANCEL

4. Press any character key on the keyboard. A set of messages similar to the following appears, depending on the drive letter you designated:

```
Deleting file C:\shelldrv.sys
Deleting file C:\shellhlp.dta
Deleting file C:\shellres.exe
Deleting file C:\shell1.ovr
Deleting file C:\shell2.ovr
Deleting file C:\shell3.ovr
Deleting file C:\shell4.ovr
Deleting file C:\shell5.ovr
Deleting file C:\shelutil.com
Deleting file C:\time.sys
Deleting file C:\wtime.com
```

When all of the files are copied, the DOS prompt reappears.

5. The Menu Manager remains in effect for the current session. To start a new session without the Menu Manager, press Ctrl-Alt-Del.
6. If you are working with a diskette, write-protect it again.

Defining a Monitor for the Menu Manager

Option 5 on the SHELUTIL Menu allows you to set up your monitor for use with the Menu Manager and applications programs. You can use the Menu Manager with either a high-resolution monochrome monitor (one with a 9-pin connector) or with a color monitor. You cannot use the Menu Manager with a composite monochrome graphics monitor (one with a round video connector). In that case, you must delete or disable the Menu Manager.

1. If you are defining a monitor for the Menu Manager on a diskette, remove any write-protection before proceeding.
2. Enter 5 at the SHELUTIL menu, and press Enter. The following message appears:

Do you have a high resolution monochrome monitor? (y/n)

- 3 If you have a high-resolution monochrome monitor, enter Y, and press Enter.

If you have a color monitor, enter N, and press Enter. The following message appears:

Type in the disk DRIVE LETTER and Enter with Bull
Menu Manager:

4. Enter the letter of the drive containing the Menu Manager. The following message appears:

Press any key to continue <ESC> to
CANCEL

5. Press any character key on the keyboard. The DOS prompt reappears.
6. Press Ctrl-Alt-Del to restart your PC with the change effective.
7. If you are working with a diskette, write-protect it again.

Installing Menu Mgr Without Help, and Help Without Menu Mgr

You can install the Menu Manager and the Help files independently by selecting items 6 or 7, respectively. The procedure is identical to that described in "Installing the Menu Manager/Help" in this section.

USING DOS-HELP

DOS-Help provides an online quick reference guide to DOS commands. Each DOS-Help entry includes the following information:

- The uses of the command
- The format of the command
- A description of each command option.

Many DOS-Help entries also include:

- Examples of usage
- Information about related commands.

There are three ways to use DOS-Help when the Menu Manager is installed:

1. To display the HELP menu (a list of the DOS commands and topics in DOS-Help) press function key F9 at the DOS prompt.
2. To display DOS-Help for a particular command, type the command name at the DOS prompt, and press function key F9.
3. To display the HELP menu from the Main Menu of the Menu Manager, press function key F9 at the DOS prompt.

When the HELP menu appears, use the arrow keys to select the command you would like explained. As you move the cursor over each command, a window at the bottom of the screen displays the format and a brief description of the command.

If you want more information about a particular command, move the cursor to the command name and press Enter. The first page of information about the command is displayed. If there are additional pages, you can move between them by pressing any key.

The following keys perform functions on DOS-Help command pages:

Key	Function
F7	Return to the previous screen or return to the HELP menu.
F9	Skip to the next related topic.
Home	Display the HELP menu.
Esc	Exit, and return to the location you were in when you called DOS-Help.
Any Key	Display the next page or related topic.

If a key has a function on a page, it is listed at the bottom of the screen. On certain screens, you can also type a number to select help on a related topic.

The quick way to exit DOS-Help is to press Esc. You return directly to the Main Menu of the Menu Manager, the DOS prompt, or your partially typed command; wherever you were when you called DOS-Help.

Although you can use DOS-Help through the Menu Manager, it is independent of the Menu Manager. You can call DOS-Help from the DOS prompt, even if you have deleted the Menu Manager from the system.

There are two ways to use DOS-Help when the Menu Manager is not installed:

1. To display the HELP menu, type HELP at the DOS prompt.
2. To call DOS-Help for a particular command, type HELP and the name of the command on the same line of the DOS prompt.

DOS must be able to locate the DOS-Help files. If the file HELP.EXE is not in the current directory or in the indicated directory, the following message appears:

Bad command or file name

If the file HELP.EXE is not in the current directory, you can use a pathname before the HELP command name. Refer to Section 3 of the *MS-DOS Reference Manual* (Order No. HU95), for instructions on using pathnames with commands.

Unlike the Menu Manager, you can use DOS-Help with a composite monochrome graphics monitor. If you have a composite monochrome graphics monitor, you can use DOS-Help during any session by typing the following command:

MODE BW80

To make this setting automatic for every session, put the MODE command in your AUTOEXEC.BAT file. (Refer to Section 9 of the *MS-DOS Reference Manual* (Order No. HU95), for information about creating an AUTOEXEC.BAT file.)

If you do not use DOS-Help, you can delete it from your system to save space on a disk. You must delete the DOS-Help files from each disk separately, using either the DEL or ERASE command.

The following are the DOS-Help files:

HELP.EXE
HELPPDIR
HELPPDIR.DCD
HELPPSCRN

Appendix A

CONFIGURING YOUR SYSTEM

In this appendix:	See page
What is a Configuration File.....	A-2
Checking for CONFIG.SYS.....	A-2
CONFIG.SYS Command Summary.....	A-3
Sample CONFIG.SYS File.....	A-4
Command Descriptions.....	A-5
BREAK.....	A-6
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LASTDRIVE.....	A-12
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STACKS.....	A-14

WHAT IS A CONFIGURATION FILE

The configuration file CONFIG.SYS is a file that contains certain commands that MS-DOS checks when you start up your computer. Each time you start MS-DOS, it searches the root directory of the drive in which it was started for a file named CONFIG.SYS.

The CONFIG.SYS file lets you change your system default configuration settings. For example, you can add installable device drivers to your system by including special commands in your CONFIG.SYS file.

Checking for CONFIG.SYS

You can use the DIR command to see if the CONFIG.SYS file is already on your disk. If it is on the disk, you can use the TYPE command to display it.

If CONFIG.SYS already exists, you may want to include other commands in the file. For example, you may want to configure for a new device, such as a mouse or an external drive.

If your MS-DOS disk does not have a CONFIG.SYS file, you can use the MS-DOS line editor, Edlin, to create one and then save it on the MS-DOS disk in your root directory. If CONFIG.SYS already exists and you want to change it, you can use Edlin to edit it.

CONFIG.SYS Command Summary

The following table briefly describes the purpose of each configuration command:

Command	Purpose
BREAK	Sets Control-C check.
BUFFERS	Sets the number of sector buffers.
COUNTRY	Allows for international time, date, and currency.
DEVICE	Installs the device driver in the system.
FCBS	Specifies the number of FCBs that can be open concurrently.
FILES	Sets the number of files that can be open at one time.
LASTDRIVE	Sets the maximum drive letter allowed in the system.
SHELL	Allows you to load another command processor (instead of COMMAND.COM).
STACKS	Supports the dynamic use of data stacks.

Sample CONFIG.SYS File

A typical configuration file might look like this:

```
BUFFERS=30

DEVICE=C:\DEV\NETWORK.SYS

BREAK=ON

SHELL=C:\BIN\COMMAND.COM C:\BIN /P

LASTDRIVE=Z
```

The following explains how this sample CONFIG.SYS file configures the system:

Command	Purpose
BUFFERS	Sets the number of buffers in memory to 30.
DEVICE	Sets a search path of C:\DEV\NETWORK.SYS to find the device driver being added to the system. In this case, it is network software. Generally, you will receive a disk with some installation software when you purchase a new device. Make sure that the device driver is in the directory that you specify in the DEVICE command.
BREAK	Makes it possible to use Control-C in real mode to stop a program, depending on the program that you are running.
SHELL	Sets the MS-DOS command processor to the COMMAND.COM file located in the BIN directory on the disk in drive C. A:\BIN tells the command processor where to look for COMMAND.COM if it needs to reread the disk. The /p switch is used by the COMMAND.COM shell.
LASTDRIVE	Sets the last available label for a logical or physical drive to z. In other words, on this PC, letters from a to z are available as labels for logical or physical disk drives.

COMMAND DESCRIPTIONS

The following pages describe each configuration command in detail.

BREAK

PURPOSE: Sets Control-C check.

FORMAT: BREAK=on

or

BREAK=off

Default: BREAK=on

COMMENTS: Depending on the program you are running, you may use Ctrl-C to stop an activity (for example, to stop sorting a file). Normally, MS-DOS checks to see whether you have pressed Ctrl-C only while it is reading from the keyboard or writing to the screen or printer. Therefore, setting BREAK to on extends Ctrl-C checking to other functions, such as disk reading and writing.

EXAMPLE: To turn off Ctrl-C checking, put the following line in your CONFIG.SYS file:

BREAK=OFF

BUFFERS

PURPOSE: Allows you to set the number of disk buffers that DOS allocates in memory at the time you start the system.

FORMAT: BUFFERS=x

WHERE: x

The number of disk buffers, from 2 to 255.

Default:	Memory Size	Buffers
	For a base system	2
	Any disk over 360K bytes	3
	128K to 255K bytes	5
	256K to 511K bytes	10
	512K bytes or more	15

COMMENTS: A disk buffer is a block of memory that DOS uses to hold data when reading or writing. For applications such as word processors, a number between 10 and 20 provides the best performance. If you plan to create a lot of subdirectories, you may want to increase the buffers value between 20 and 30. Remember, that buffers take up 512 bytes of space, so the more buffers you have, the less memory you will have available for applications. Feel free to experiment with different buffer settings to see how they affect your PC's operation.

EXAMPLE: To create 20 disk buffers, put the following line in your CONFIG.SYS file:

BUFFERS=20

COUNTRY

PURPOSE: COUNTRY allows MS-DOS to use international time, date, currency, and case conversions.

FORMAT: COUNTRY=xxx[, [yyy], [drive:]filename]]

WHERE: xxx

The phone country code.

yyy

The code page for the country.

filename

A file containing country information.

Default: Unless otherwise specified, United States settings are assumed.

If you do not specify file name, MS-DOS uses the COUNTRY.SYS file which contains country-specific information for your country.

COMMENTS: This configuration command identifies to MS-DOS which country's character set you intend to use.

For a list of valid country codes, refer to Appendix D.

EXAMPLE: The following example sets country to France (=033) and converts international currency, time, date, and case to French conventions:

BUFFERS=003

DEVICE

PURPOSE: Installs the specified device driver.

SYNTAX: device=[drive:][path]filename[argument]

WHERE: argument

Includes any switches accepted by filename.

Default: None.

COMMENTS: The standard installable device drivers provided with MS-DOS are ANSI.SYS, DISPLAY.SYS, DRIVER.SYS, EMMDRV.SYS, PRINTER.SYS, RAMDRIVE.SYS, SMARTDRV.SYS, and VDISK.SYS. For more information on these installable device drivers, see Appendix B.

Other Installable Device Drivers

If you purchase a new device, such as a mouse or a scanner, you generally receive driver software with that device. You can install these device drivers by using the device command. Once you have installed a device driver, make sure that the device driver is in the directory that you specify in any device commands.

NOTE: The device drivers COUNTRY.SYS and KEYBOARD.SYS are automatically loaded by MS-DOS. Do not try to load either of these with the device command. If you do, it will "hang" your system (MS-DOS will not start).

EXAMPLE: If you plan to use the ANSI escape sequences described in Appendix B, create a CONFIG.SYS file that contains the following command:

DEVICE=ANSI.SYS

This command causes MS-DOS to replace all keyboard input and screen output support with the ANSI escape sequences.

FCBS

PURPOSE: Allows you to determine the number of File Control Blocks (FCBs) that can be open concurrently.

FORMAT: FCBS=x,y

WHERE: x

The number of files that File Control Blocks can open at one time.

y

The number of files opened by FCBs that MS-DOS cannot close automatically.

Default: FCBS=4,0

COMMENTS: A file control block is a data structure in real mode used to control open files.

The allowed values for x range from 1 to 255. The allowed values for y also range from 1 to 255. If an application tries to open more than x files by FCBs, then all but the first y files may be closed by MS-DOS.

NOTE: The preferred method of accessing files is to use file handles instead of file control blocks. However, some older applications that you want to use may require you to use the FCBS command in your CONFIG.SYS file. Thus, you should only use the FCBS command if an application requires you to do so.

EXAMPLE: To open up to four files by FCBs and to protect the first two files from being closed, put the following line in your CONFIG.SYS file:

FCBS=4,2

FILES

PURPOSE: Sets the number of files that can be open at any one time.

FORMAT: FILES=x

WHERE: x

The number of files that can be opened concurrently.

Default: files=8

COMMENTS: The valid values for x range from 8 to 255.

NOTE: A process must issue MS-DOS system call 67H to activate the extended handle.

EXAMPLE: To let MS-DOS open 20 files at one time, put the following line in your CONFIG.SYS file:

FILES=20

LASTDRIVE

PURPOSE: Sets the maximum drive letter that can be used by the system.

FORMAT: LASTDRIVE=X

WHERE: X

Can be any letter from A to Z.

Default: LASTDRIVE=E

COMMENTS: The x value represents the last valid drive that MS-DOS will accept. The minimum number is equal to the number of drives you have installed on your computer.

This command is useful in a network environment. At startup, MS-DOS recognizes five drives you have on your system. To make extra drives defined by LASTDRIVE valid, a network redirection must occur.

Note that MS-DOS allocates a data structure for each drive that you specify, so you should not specify more drives than are necessary.

EXAMPLE: The following command sets the last drive to M, unless you have added an external logical device with DRIVER.SYS. For information about DRIVER.SYS, refer to Appendix B.

LASTDRIVE=M

SHELL

PURPOSE: Begins execution of the shell (top-level command processor) from a file defined by the specified pathname.

FORMAT: SHELL=[drive:][path]filename

WHERE: filename

A command processor program.

Default: The default command processor for MS-DOS is COMMAND.COM.

COMMENTS: Instead of reading the standard COMMAND.COM, MS-DOS starts the processor specified in filename.

System programmers who write their own command processors (instead of using the MS-DOS file, COMMAND.COM) should use the shell command to specify the name of their shell program.

MS-DOS sets the COMSPEC environment variable equal to the drive, path, and filename specified on the shell command line. This setting overrides the default value for COMSPEC (the drive and pathname of the command processor initially used to start MS-DOS). The operating system uses the COMSPEC environment setting to determine which file to use when reloading any transient part of the command processor.

NOTE: The shell command does not accept switches. However, if the new command processor does accept switches, you can include those switches in this format. For example, suppose SHELL=NEWCMDP.COM, and NEWCMDP.COM accepts the /c, /p, /e switches. You can include any of these switches in the SHELL command line. Thus, the following would be a valid command:

SHELL=NEWCMDP.COM /p

EXAMPLE: The following command uses the file \BIN\NEWSHELL as the command processor:

SHELL=\BIN\NEWSHELL

STACKS

PURPOSE: Supports the dynamic use of data stacks.

FORMAT: STACKS=n,s

WHERE: n

The number of stacks and s is the size of each stack.

Default:	PC	Stacks
	IBM PC-Portable	0,0
	Other computers	9,128

COMMENTS: The valid values for n range from 0 to 64. The valid values for s range from 0 to 512.

When there is a hardware interrupt, MS-DOS allocates one stack from n stacks specified. When STACKS=0,0, MS-DOS will not switch stacks at interrupt time.

EXAMPLE: To allocate eight stacks of 512 bytes each for hardware interrupt handling, you would include the following command in your CONFIG.SYS file:

STACKS=8,512

Appendix B

INSTALLING

DEVICE DRIVERS

In this appendix:	See page
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Using DRVINS.....	B-4
Installable Device Drivers.....	B-5
ANSI.SYS.....	B-6
DISPLAY.SYS.....	B-6
DRIVER.SYS.....	B-7
EMMDRV.SYS.....	B-9
PRINTER.SYS.....	B-10
RAMDRIVE.SYS.....	B-11
SMARTDRV.SYS.....	B-13
VDISK.SYS.....	B-14

INTRODUCTION

Device drivers are programs that let the operating system recognize devices that are not part of the PC. Examples of devices are a modem, a printer, a mouse, and an external disk drive. Some device drivers are already installed with MS-DOS. Other device drivers, called installable device drivers, come with MS-DOS for you to install if you need them.

This appendix describes the installable device drivers provided with MS-DOS:

- ANSI.SYS loads the ANSI character set.
- DISPLAY.SYS supports code page switching on the console device.
- DRIVER.SYS supports external flexible disk drives.
- EMMDRV.SYS supports applications that adhere to the Lotus/Intel/Microsoft (LIM) Expanded Memory Specification (EMS).
- PRINTER.SYS provides code page support for PRN, LPT1, LPT2, and LPT3.
- RAMDRIVE.SYS supports one or more RAM (virtual) drives.
- SMARTDRV.SYS supports disk caching for computers that have hard drives and expanded or extended memory.
- VDISK.SYS supports one or more virtual drives.

For more information about the device configuration command, which is used to install these device drivers, refer to Appendix A.

THE DRVINS INSTALLATION UTILITY

MS-DOS 3.3 includes a file, DRVINS, that aids you in driver installation if you are unfamiliar with installation procedures. This program is intended for novice users, and includes only the most commonly used options. Note that this utility is for hard disk users only.

DRVINS installs eight different installable drivers, adds the COUNTRY entry to the CONFIG.SYS file and the KEYB to the AUTOEXEC.BAT file, and backs up a hard disk partition.

Using DRVINS

To execute the utility, type:

DRVINS

and press the Enter key.

The DRVINS utility displays an introductory message screen, and then asks for the subdirectory where you installed the drivers or the MS-DOS BACKUP and FORMAT commands. Enter the complete pathname for the subdirectory. If you enter a path that does not already exist, this path is created for you.

The introductory screen looks like this:

```
* * * * * DRVINS * * * * *
```

This utility will perform a basic installation for optional drivers or aid in the backup of a fixed disk partition.

Advanced users may wish to add their own entry to the CONFIG.SYS file.

You must enter the subdirectory name where your drivers or your DOS utilities (BACKUP and FORMAT) were installed. If you do not know the subdirectory, exit the menu screen with the ESC key. Refer to the *User Manual* for assistance.

Press any key to continue.

The main menu allows you to select driver installation, international country code and keyboard, or fixed disk backup:

- 1) install optional drivers
 - 2) select COUNTRY and KEYBOARD codes
 - 3) backup fixed disk partition
- Enter the number of the option or ESC to quit

Option 1 displays a menu listing eight installable drivers and an information option. When a driver is selected, the appropriate entry is added to the CONFIG.SYS file.

Option 2 adds an entry to the CONFIG.SYS and AUTOEXEC.BAT files.

On finishing this procedure, verify that these entries are correct and compatible with all other entries in these two files. If the entry must be modified or deleted, refer to Section 6 for more information.

INSTALLABLE DEVICE DRIVERS

The MS-DOS installable device drivers are explained in detail on the following pages.

ANSI.SYS

The ANSI.SYS installable device driver lets you use ANSI escape sequences in real mode. An ANSI escape sequence is a series of characters (beginning with an escape character or keystroke) developed by the American National Standards Institute (ANSI). These sequences are used to define functions for MS-DOS. Specifically, you can change graphics functions and affect the movement of the cursor.

To install ANSI.SYS, include a command line of the following form in your CONFIG.SYS file:

```
DEVICE=[drive][path]ANSI.SYS
```

DISPLAY.SYS

DISPLAY.SYS is an installable device driver that supports code page switching for the console device.

To install DISPLAY.SYS, insert a command line of the following form in your CONFIG.SYS file:

```
DEVICE=[drive:][path]DISPLAY.SYS  
con[:]=type[,hwcp][,n,m]
```

Where:

type

Indicates the display adapter in use. Valid values include MONO, CGA, EGA, and LCD.

hwcp

Indicates the code page supported by the hardware. The following values are allowed:

- 437 (United States)
- 850 (multilingual)
- 860 (Portugal)
- 863 (French-Canadian)
- 865 (Norway)

n

Specifies the number of additional code pages that can be supported. This number is dependent on the hardware. MONO and CGA do not support other fonts, so n must be 0. EGA can be 2 and LCD can be 1.

m

Indicates the number of subfonts that are supported for each code page.

DRIVER.SYS

DRIVER.SYS is an installable device driver that supports external disk drives.

To install DRIVER.SYS, insert a command line of the following form in your CONFIG.SYS file:

```
DEVICE=DRIVER.SYS /d:number [/c]
[/f:factor][/h:heads][/n][/s:sectors]
[/t:tracks]
```

Where:

/d:number

Indicates the physical drive number, ranging from 0 to 255. The first physical diskette drive is 0, and is referenced from the MS-DOS command line as drive A. Drive 1 is the second physical diskette drive. Drive 2 is the third, which must be external.

/c

Indicates that change-line (doorlock) support is required. This means that the device driver will be able to tell whether the door of a diskette drive is open or closed. If the door is open, the device driver assumes that the drive does not have a diskette in it yet.

`/f:factor`

Specifies the device type (form factor). The default value is 2. factor=form factor index, where:

- 0 = 160/180 kilobytes (KB), or
- 0 = 320/360 KB
- 1 = 1.2 megabytes (MB)
- 2 = 720 KB (3-1/2 inch diskette)
- 7 = 1.44 MB (3-1/2 inch diskette)

`/h:heads`

Maximum head number, ranging from 1 to 99. The default value is 2.

`/n`

Specifies a nonremovable block device. A hard disk is an example of a nonremovable block device.

`/s:sectors`

Number of sectors per track, ranging from 1 to 99. The default value is 9.

`/t:tracks`

Number of tracks per side on the block device, ranging from 1 to 999. The default value is 80.

Example

To add an external 720 KB drive to your PC, include the following line in the CONFIG.SYS file:

```
DEVICE=DRIVER.SYS /d:02
```

EMMDRV.SYS

EMMDRV.SYS is an installable device driver that supports applications that adhere to the Lotus/Intel/Microsoft (LIM) Expanded Memory Specification (EMS). Refer to RAMDRIVE.SYS in this appendix.

To install the Expanded Memory Manager, add the following command to your CONFIG.SYS file:

```
DEVICE=EMMDRV.SYS S Knnnn
```

Where:

S

Specifies the Software Emulation feature. Software Emulation uses extended memory, if installed, to emulate expanded memory.

Knnnn

Specifies the total number of kilobytes (to be managed by the Expanded Memory Manager (EMM)). The value specified MUST be between 16 KB and 8192 (8 MB), and be a multiple of 16. To use extended memory installed on the system Knnnn should equal extended memory less 1024 rounded to the nearest 16 KB multiple. If the specified number does not meet these requirements, an error message is displayed and the EMM is not installed.

PRINTER.SYS

PRINTER.SYS is an installable device driver that supports code page switching for parallel ports LPT1, LPT2, and LPT3. (The port name PRN may be substituted for LPT1 to refer to the first parallel port.)

NOTE: Your printer must support code page switching.

To install PRINTER.SYS, insert a command line of the following form in your CONFIG.SYS file:

```
DEVICE=[drive:][path]PRINTER.SYS lptx=  
[type[,hwcp[,...]][,n]]
```

Where:

type

Indicates the printer in use.

hwcp

Indicates the code page supported by the hardware. The following values are allowed:

- 437 (United States)
- 850 (Multilingual)
- 860 (Portugal)
- 863 (French-Canadian)
- 865 (Norway)

n

Indicates the number of additional code pages that can be supported. This number is dependent on the hardware.

RAMDRIVE.SYS

RAMDRIVE.SYS is an installable device driver that lets you use a portion of your PC's memory as if it were a hard disk. This memory area is called a RAM disk and is sometimes referred to as a virtual disk.

RAM disks are much faster than hard disks because the information they contain is always loaded into memory. If your PC has extended memory installed (starting at the one MB boundary), or if you have an expanded memory board that meets the Lotus/Intel/Microsoft Expanded Memory Specification, you can use this memory for one or more RAM disks. Otherwise, RAMDRIVE.SYS places RAM disks in low memory.

NOTE: The command `DEVICE=RAMDRIVE.SYS` increases the size of MS-DOS resident in memory.

To install RAMDRIVE.SYS, include a command line of the following from in your CONFIG.SYS file:

```
DEVICE=RAMDRIVE.SYS [disksize] [sector-size]
[entries] [/e]
```

or

```
DEVICE=RAMDRIVE.SYS [disksize] [sector-size]
[entries] [/a]
```

The RAMDRIVE.SYS device driver accepts the following options:

disksize

Specifies the disk size in kilobytes. The default size is 64 KB; the minimum size, 16.

sector-size

Specifies the sector size in bytes. The default size is 128 bytes. The following values are allowed: 128, 256, 512, and 1024 bytes.

entries

Specifies the number of root directory entries. The default value is 64; the minimum 4; the maximum 1024.

RAMDRIVE.SYS adjusts the value of entries to the nearest sector boundary. For example, if you specify a value of 25 when the sector size is 512 bytes, the 25 is rounded up to 32, which is the next multiple of 16 (there are sixteen 32-byte directory entries in 512 bytes).

/e

Lets you use extended memory (above 1 megabyte) as a RAM disk if it has been installed. If you use this switch, you cannot use the /a switch. It is recommended that you use the /e switch.

/a

Lets you use an expanded memory board that meets the Lotus/Intel/Microsoft Expanded Memory Specification for a RAM drive--if that board has been installed. If you use this switch, you cannot use the /e switch.

NOTE: When you reset or turn off the power on your PC, the information stored in RAM disks is lost.

SMARTDRV.SYS

SMARTDRV.SYS is a disk caching program that reduces the amount of time your PC spends reading data from your hard disk. It provides the most effective use of your expanded or extended memory.

SMARTDRV.SYS is ideal if you use many applications and files at once. It is especially useful when running multiple standard applications that require swapping--copying applications to and from the hard disk to make room for all applications in memory. Although SMARTDRV.SYS can be used in conjunction with applications that use expanded or extended memory, it should not be used with other memory-disk or disk caching programs.

To install SMARTDRV.SYS, include a command line of the following from in your CONFIG.SYS file:

```
DEVICE=SMARTDRV.SYS[size][/a]
```

Where:

size

The amount of memory you want SMARTDRV.SYS to have. If you do not specify an amount of memory, SMARTDRV.SYS receives 256 KB (the default size). If you plan to run a standard application that uses expanded or extended memory, you should specify a size that leaves enough memory for that application.

/a

Use this switch if you have expanded memory or to use your extended memory board as expanded memory.

For more information on how to get the most out of your hard drive using SMARTDRV.SYS, refer to Appendix E.

VDISK.SYS

VDISK.SYS is an installable device driver that lets you use a portion of your PC's memory as if it were a hard disk. This memory area is called a virtual disk (VDISK).

NOTE: VDISK is not compatible with the EMMDRV.SYS EMM driver discussed in this manual. To use a virtual memory disk with the EMMDRV.SYS driver, you must use RAMDRIVE.SYS.

A VDISK is an area of memory set aside for data storage. You can store files in and read files from a VDISK as if it were a disk drive. Virtual disks are faster than a hard disk since they operate at the speed of the PC's memory.

NOTE: You must save the VDISK files you wish to keep because all data is lost when the system is restarted or if power is lost.

To install VDISK, include a command line of the following form in your CONFIG.SYS file:

```
DEVICE=[drive:][path]VDISK.SYS[sss][rrr]  
[ddd][/e]
```

Where:

/sss

Specifies the size of the VDISK in kilobytes. The minimum size is 2 KB.

/rrr

Specifies the sector size in bytes. Permitted values are 128, 256 and 512. The default value is 128.

/ddd

Specifies the number (nnn) of directory entries to be allowed on the VDISK. nnn should be a multiple of 16. DOS accommodates up to 752 directory entries 32 bytes each in size. The default value depends on the VDISK size. For capacities up to 180, 360, or 1200 KB, the default directory entries are 64, 112, and 224, respectively.

/e

Lets you use extended memory (above 1 MB) as a virtual disk.

The virtual disks are assigned drive designations following those of the real disk drives. If your system has two diskette drives, the first (or only) virtual disk drive is referred to as drive C. If your system already has a drive C, the first virtual disk is regarded as drive D, the next as E, and so on.

After the successful installation of a virtual disk, VDISK informs you about the size, the space available for data (as seen via CHKDSK), the sector size, the sectors per cluster, and the number of directory entries of the virtual disk.

Appendix C

CONFIGURING YOUR HARD DISK (FDISK)

In this appendix:	See page
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Checking for a Configured and Formatted Disk.....	C-3
How to Start FDISK.....	C-4
How to Create a DOS Partition.....	C-5
Selection 1: Create Primary DOS Partition.....	C-6
Creating a Single MS-DOS Partition.....	C-6
Formatting Your Hard Disk to Start MS-DOS.....	C-7
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Selection 2: Create Extended DOS Partition.....	C-8
Creating an Extended DOS Partition.....	C-8
Selection 3: Create Logical Drive in the DOS Partition.....	C-9
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Selecting the Next Fixed Disk Drive.....	C-16

INTRODUCTION

Hard disks can be divided into one to four separate sections, called partitions. Partitions separate your hard disk into individual areas, and each partition can contain a different operating system.

To prepare your hard disk for the MS-DOS operating system, you must create a partition for MS-DOS, called a DOS partition. You can create a DOS partition on your hard disk by using a menu-driven utility called FDISK. You must use FDISK if you want to do one of the following:

- Create a primary MS-DOS partition
- Create an extended DOS partition
- Change the active partition
- Delete a DOS partition
- Display partition information
- Review or modify the configuration of another hard disk on your computer.

WARNING

Reconfiguring your disk with FDISK destroys all existing files. Be sure to have a backup of all files on your disk before you delete an MS-DOS partition with FDISK.

Checking for a Configured and Formatted Disk

To find out whether your hard disk has been partitioned and formatted, do the following:

1. First, try to start MS-DOS from your hard disk.
 - a. If it starts, your hard disk is both configured and formatted, and the MS-DOS system files are on the disk.
 - b. If MS-DOS does not start, your disk is not formatted to start MS-DOS, but may have been configured.
2. If MS-DOS did not start, check to see if the disk has been configured with FDISK. Place the MS-DOS master diskette in drive A and press Control-Alt-Del to start MS-DOS. Then run FDISK and select the "Display Partition Information" to see if any MS-DOS partitions exist.
 - a. If any do exist, your disk has been configured.
 - b. If no partitions exist, follow the instructions in this appendix to configure your disk.
3. After your hard disk is configured, be sure to format your disk with the MS-DOS format /s command before you copy files onto the disk. Otherwise, your hard disk will be unusable.

How to Start FDISK

The FDISK utility uses menus to lead you through each procedure. To start FDISK:

1. Place the MS-DOS diskette in drive A.
2. Turn on your PC to start MS-DOS.
3. Type the following command and press Enter:

FDISK

FDISK displays its main menu on your screen. This menu lists five choices. If your PC has only one hard disk, option 5 does not appear.

Disk Options

Current Fixed Disk Drive: 1

Choose one of the following:

1. Create DOS Partition
2. Change Active Partition
3. Delete DOS Partition
4. Display Partition Data
5. Select Next Fixed Disk Drive

Enter choice: [1]

Press ESC to return to DOS

The following pages describe each of these options, and show the menus and other information they display. To return to MS-DOS from the main menu, press the Esc key. You can also use the Esc key to return to the main menu from any of the FDISK menus.

Most of the FDISK menus display a default value. To choose the default value, press the Enter key. To choose another value, type the value you want, and press the Enter key.

HOW TO CREATE A DOS PARTITION

If you choose the first option on the main menu, and if your hard disk is not yet completely partitioned, FDISK displays the following screen. If no extended partitions exist, option 3 is not displayed:

Create DOS Partition

Current Fixed Disk Drive: 1

1. Create Primary DOS Partition
2. Create Extended DOS Partition
3. Create Logical DOS Drive(s) in the Extended DOS Partition.

Enter choice: [1]

Press ESC to return to FDISK Options

Selection 1: Create Primary DOS Partition

You must create a primary MS-DOS partition before you can create any extended MS-DOS partitions on your disk. In most cases, you need only one MS-DOS partition for your entire disk.

To create a primary MS-DOS partition, press the Enter key to accept the default selection (1).

The Create Primary DOS Partition menu appears next:

Create Primary DOS Partition

Current Fixed Disk Drive: 1

Do you wish to use the maximum size for a DOS partition and make the DOS partition active (Y/N)? [Y]

Press ESC to return to FDISK Options

Creating a Single MS-DOS Partition

If you use your entire hard disk for MS-DOS, you only need to use the FDISK program once to create the primary MS-DOS partition. To use the entire hard disk (up to 32 megabytes) for MS-DOS, press the Enter key to accept the default selection (Y). FDISK displays the following message:

System will now restart

Insert DOS diskette in drive A:

Press any key when ready . . .

Put your MS-DOS disk in drive A and press any key to restart MS-DOS.

Formatting Your Hard Disk to Start MS-DOS

Now that you have created your MS-DOS partition, you must format your hard disk so that MS-DOS can use it. To start MS-DOS from your hard disk, remember to use the /s switch with the format command. For example, if you are formatting the disk in drive C, and want to start MS-DOS from disk, type the following command:

```
FORMAT C: /s
```

Creating More Than One MS-DOS Partition

You may choose to create a primary MS-DOS partition smaller than the maximum size. To do this, type N (for No) in response to the question on the first Create Primary DOS Partition menu. FDISK displays a second Create Primary DOS Partition menu like the following.

NOTE: If you choose this option you must make the partition active by using option 2 on the main menu. If you do not make the partition active you will not be able to start the system from the hard disk.

From this menu, you can specify the size of the primary MS-DOS partition:

Create Primary DOS Partition

Current Fixed Disk Drive: 1

Partition Status Type Start End Size

Total disk space is 732 cylinders

Maximum space available for partition is 732 cylinders

Enter partition size [732]

Press ESC to return to FDISK Options

Configuring Your Hard Disk (FDISK)

The space available on your hard disk is measured in cylinders. This menu shows the total number of cylinders available for a hard disk partition, and prompts you to enter the size of your new partition. The default size for the partition is the maximum available space on the hard disk or 32 MB, whichever is less. Press the Enter key if you want the default size; otherwise, type the size (in cylinders) that you want for the partition, and press the Enter key.

Any part of the disk that you do not use for the primary MS-DOS partition can be used for an extended MS-DOS partition.

Selection 2: Create Extended DOS Partition

You can use FDISK to create an extended partition if you create a DOS partition and still have space left on the disk.

To select "Create Extended DOS Partition," type 2, then press the Enter key. In response, FDISK displays a menu like this one:

Create Extended DOS Partition

Current Fixed Disk Drive: 1

Partition	Status	Type	Start	End	Size
-----------	--------	------	-------	-----	------

C:	1	A PRI DOS	0	599	600
----	---	-----------	---	-----	-----

Total disk space is 1263 cylinders

Maximum space available for partition is 663 cylinders.

Enter partition size [663]

Press ESC to return to FDISK Options

This menu shows the total number of cylinders available for an extended partition. The default for the partition size is the maximum available space on the hard disk or 32 megabytes, whichever is less. Press the Enter key if you want the default; otherwise, type the size (in cylinders) that you want for the partition, and press the Enter key.

NOTE: If FDISK finds any defective tracks at the start of the partition, it adjusts the partition boundaries to avoid those bad tracks.

Selection 3: Create Logical Drive in the Extended DOS Partition

When you have created an extended partition, you must specify one or more drive letters for that area of the disk. FDISK automatically displays this menu after you create an extended partition. FDISK displays a menu similar to the following if you choose option 3 from the Create DOS Partition menu:

Create Logical DOS Drive(s)

Drv Start End Size

D: 650 1049 400

Total partition space is 1000 cylinders.
Maximum space available for logical drive is
600 cylinders.

Enter logical drive size [600]

Press ESC to return to FDISK options

You can designate the entire partition as one logical drive, or divide it into two or more logical drives. For example, to segregate a particular application and its data files to their own drive, you may want to create a second logical drive on the partition.

Configuring Your Hard Disk (FDISK)

Because you cannot use an MS-DOS extended partition without a drive letter, FDISK continues to prompt you for logical disk drive information until the whole partition has been assigned to a logical drive.

When the entire partition is assigned to logical drives, FDISK displays this message:

**All available space in the Extended DOS
partition is assigned to logical drives.**

Press Esc to return to the main FDISK menu. From there, you can restart MS-DOS, or select another option.

HOW TO CHANGE THE ACTIVE PARTITION

If you choose the second option on the main menu, FDISK displays a screen showing the status of each partition on your hard disk. The active partition, indicated by a status of A, contains the operating system and files you access when you turn on or reset your PC. If you have created a partition on your disk with another operating system, this menu allows you to make that partition active. Only one partition is active at a time; the others are not active.

For example, if you have both XENIX and DOS partitions on your disk, the Change Active Partition menu might look like this:

Change Active Partition					
Current Fixed Disk Drive: 1					
Partition	Status	Type	Start	End	Size
C: 1		non DOS	0	1	1
2		non DOS	2	401	400
3	A	PRI DOS	402	731	330
Total disk space is 732 cylinders					
Enter the number of the partition you want to make active:[1]					
Press ESC to return to FDISK options					

Type the number of the partition that you want to activate, and press the Enter key. The default setting is the active partition number.

If your hard disk contains only MS-DOS partitions, FDISK displays the following message instead of prompting you for the partition that you want to activate:

The only bootable partition on Drive 1 is already marked active.

Press Esc to return to FDISK options.

HOW TO DELETE A DOS PARTITION

If you choose option 3 on the main menu, FDISK displays the following menu, which asks you to identify whether the partition you want to delete is a primary or extended DOS partition:

Delete DOS Partition

Current Fixed Disk Drive: 1

1. Delete Primary DOS Partition
2. Delete Extended DOS Partition
3. Delete Logical DOS Drive(s) in the Extended DOS Partition

Enter choice: []

Press ESC to return to FDISK Options

Type the number of the selection you want and press the Enter key. The next menu, whether for a primary or extended DOS partition, shows the status of that partition. When you delete a DOS partition, FDISK deletes the partition boundaries and any data that existed in that partition. Once you delete the partition, you cannot recover the data that was on it.

NOTE: You cannot use FDISK to delete a non-DOS partition. Instead, to continue using MS-DOS after you have deleted the DOS partition, you must put an MS-DOS program disk into drive A. To start a different operating system in another partition of your hard disk, you must change the active partition to that number before you delete the DOS partition.

Selection 1: Delete Primary DOS Partition

The Delete Primary DOS Partition menu looks similar to this:

```
Delete Primary DOS Partition
Current Fixed Disk Drive: 1

Partition Status  Type  Start  End  Size
C: 1      A   PRI DOS    0  399   400
      2           EXT DOS   400  731   332

Total disk space is 732 cylinders.

Warning!  Data in Primary DOS
partition will be lost.  Do you wish
to continue. . . . .? [N]

Press ESC to return to FDISK Options
```

If you do not want to delete the primary DOS partition, press the Enter key to accept the default value (N).

To delete the primary DOS partition, type Y and press the Enter key.

Selection 2: Delete Extended DOS Partition

If you choose to delete an extended partition, you must first delete the logical drives associated with that partition.

Selection 3: Delete Logical Drive in the Extended DOS Partition

To delete a logical drive, type 3 to select the option Delete Logical DOS Drive(s) in the Extended DOS Partition from the Delete DOS Partition menu. Then press the Enter key. FDISK displays a menu like the following:

Delete Logical DOS Drive(s)

Drv Start End Size

D: 400 999 600

E: 1000 1399 400

Total partition space is 1000 cylinders.

Warning! Data in the logical DOS drive

will be lost. What drive do you wish

to delete.? []

Press ESC to return to FDISK Options

Type the letter of the drive you want to delete, and press Enter. FDISK displays this message:

Are you sure.....? [N]

If this logical drive contains valuable data you have not backed up, press Enter. This stops FDISK from deleting the logical drive.

WARNING

Be sure to back up all of the files you need from the logical drive before you delete the drive. When FDISK deletes a logical drive or partition, the data is destroyed.

If you are sure you want to delete the drive, type Y (for Yes).

HOW TO DISPLAY PARTITION DATA

If you choose option 4 on the main menu, FDISK displays a menu that contains information about each of the partitions on your hard disk.

For example, the Display Partition Information menu might look like this:

Display Partition Information

Current Fixed Disk Drive: 1

Partition	Status	Type	Start	End	Size
C: 1	A	PRI DOS	0	399	400
2		EXT DOS	400	731	332

Total disk space is 732 cylinders.

The Extended DOS partition contains logical DOS drives. Do you want to display logical drive information? [Y]

Press ESC to return to FDISK Options

This screen identifies the partitions on your disk. It shows each partition's number, status and type, its starting and ending cylinder numbers, and its size in cylinders.

Configuring Your Hard Disk (FDISK)

If you have an extended partition, FDISK asks if you want to see information about that partition's logical drives. Type Y and press Enter to display a screen like the following:

Display Logical DOS Drive(s)

Drv	Start	End	Size
-----	-------	-----	------

D:	400	999	600
----	-----	-----	-----

E:	1000	1399	400
----	------	------	-----

Press ESC to return to FDISK Options

Press the ESC key to return to the main menu.

HOW TO SELECT THE NEXT FIXED DISK DRIVE

This option appears on the FDISK main menu only if you have more than one hard disk attached to your computer. If you choose this option, FDISK changes the current disk drive to the next drive.

For example, if the current disk drive is drive C, and if you choose option 5 on the main menu, FDISK changes the current disk drive to drive D. You could then choose any of the FDISK options (1 to 4) to prepare the second fixed disk for MS-DOS. Or, you could select option 5 once again to select the next drive. For example, if there is not a third fixed disk, FDISK changes the current disk drive from D back to C.

After you have selected the next drive, FDISK displays the main menu again. Note that near the top of the screen, there is a line that looks something like this:

Current fixed disk drive: 2

The activity you select will be performed on the disk shown in this line.

Appendix D

USING CODE PAGES

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INTRODUCTION

MS-DOS 3.3 provides national language support through the use of language-specific code pages. If you live in, or work with, a country other than the United States, you may choose to use the MS-DOS commands that support code page switching.

What is a Code Page

A code page is a table that defines the character set you are using. A character set is a country-specific or language-specific group of characters that are translated from the code page table and displayed by your screen or printer. Each code page character set contains 256 characters. An example of a character set is the set of letters, numbers, and symbols (such as accent marks) used by French-Canadians.

MS-DOS 3.3 supports five different code pages:

- 437--United States code page.
- 850--Multilingual code page. This code page includes all characters for most languages of European, North American, and South American countries.
- 860--Portuguese code page.
- 863--French-Canadian code page.
- 865--Nordic code page. This code page includes all characters for the Norwegian and Danish languages.

Country and Keyboard Codes

MS-DOS also provides national language support through the use of two other codes:

- A country code defines the country in which you live or work. MS-DOS uses this code to prepare and assign default code pages for your system. MS-DOS recognizes 19 different country codes.
- A keyboard code defines the type of keyboard you are using. MS-DOS recognizes 17 different keyboard codes.

National Language Support Codes

Table D-1 lists each country (or language) supported by MS-DOS 3.3. The table also lists the related country codes, default code page assignments, and related keyboard codes. The code pages shown are automatically prepared by MS-DOS when you load the corresponding country code through the CONFIG.SYS country command. If you do not specify a country code, MS-DOS loads the default United States code page 437.

Table D-1. Country/Language Codes

Country or Language	Country Code	Code Page	Keyb Code
United States	001	437,850	US
French-Canadian	002	863,850	CF
Latin America	003	437,850	LA
Netherlands	031	437,850	NL
Belgium	032	437,850	BE
France	033	437,850	FR
Spain	034	437,850	SP
Italy	039	437,850	IT
Switzerland	041	437,850	SF,SG
United Kingdom	044	437,850	UK
Denmark	045	865,850	DK
Sweden	046	437,850	SV
Norway	047	865,850	NO
Germany	049	437,850	GR
English (Int'l)	061	437,850	--
Portugal	351	860,850	PO
Finland	358	437,850	SU
Arabic Countries	785	437	--
Israel	972	437	--

NOTES: Both Swiss-French and Swiss-German use country code 041.

Code pages for Arabic and Hebrew languages are not available. Country codes 785 and 972 assume United States code page 437, but include country-specific date and time conventions.

Commands that Support National Languages

Several MS-DOS commands (new and old) support code page selection and national languages.

New MS-DOS Commands

MS-DOS 3.3 includes two new commands that support code page selection and national languages:

NLSFUNC

Loads the file containing country-specific information.

CHCP

Displays or changes the current code page for the system and all prepared devices.

Enhanced MS-DOS Commands

In addition to the new commands, MS-DOS 3.3 includes several enhanced MS-DOS commands that support code page selection. The most significant enhancements include:

KEYB

Allows you to select a country-specific keyboard code for the keyboard you are using, and a code page for the character set you prefer. You may also select an alternate keyboard definition file (other than the default KEYBOARD.SYS file) with this command, if another exists.

MODE

Includes several new options: Preparing a code page for a device, selecting a code page for a device, displaying the code pages prepared and selected for a device, and refreshing code pages that were lost due to hardware error.

SELECT

Installs MS-DOS on a new flexible disk with selected country-specific information and keyboard code.

New and Enhanced Configuration Commands

Two CONFIG.SYS commands also support country-specific information:

COUNTRY

Identifies the country in which you work or live. This command also defines country-specific conventions to be used, such as date and time formats and sorting sequence for the character set.

DEVICE

Installs device drivers in the system, including two MS-DOS installable device drivers that support code page switching. These device drivers are called:

DISPLAY.SYS

Used to install a standard console screen device with code-page support

PRINTER.SYS

Used to install a standard parallel printer with code-page support

Date and Time Formats

Four other MS-DOS commands (DATE, BACKUP, RESTORE, TIME) now use country-specific date and time conventions, based on the code pages you choose to use.

The following table lists the date and time formats related to each country (or language group). These formats are determined by the country code set in your CONFIG.SYS file.

For each country, the Date format column shows how MS-DOS would display January 3, 1989, and the Time format column shows how MS-DOS would display 5:35 p.m. (with zero seconds and zero hundredths of seconds).

Country or Language	Country Code	Date Format	Time Format
United States	001	1-03-1989	17:35:00.00
French-Canadian	002	1989-01-03	17:35:00,00
Latin America	003	03/01/1989	17:35:00.00
Netherlands	031	03-01-1989	17:35:00,00
Belgium	032	03/01/1989	17:35:00,00
France	033	03/01/1989	17:35:00,00
Spain	034	03/01/1989	17:35:00,00
Italy	039	03/01/1989	17:35:00,00
Switzerland	041	03.01.1989	17.35.00.00
United Kingdom	044	03-01-1989	17:35:00.00
Denmark	045	03-01-1989	17:35.00,00
Sweden	046	1989-01-03	17:35.00,00
Norway	047	03/01/1989	17.35.00,00
Germany	049	03.01.1989	17.35.00,00
English (Int'l)	061	03-01-1989	17:35:00.00
Portugal	351	03/01/1989	17:35:00,00
Finland	358	03.01.1989	17.35.00,00
Arabic countries	785	03/01/1989	17:35:00,00
Israel	972	03 01 1989	17:35:00.00

How to Use Code Pages

Unless you specify otherwise, MS-DOS assumes that you want to use the United States character set. To set your system to support another character set, you need to do four things:

1. Set the country code in your CONFIG.SYS file. This code identifies the country in which you live or work.
2. Load the COUNTRY.SYS file or other file containing the country-specific information for your country.
3. Set the system code page. For most country codes, MS-DOS automatically prepares two system code pages and selects the primary code page for your country automatically. If you want to use the other code page prepared for your country, you can use the CHCP command.
4. Set the keyboard code with the KEYB command.

NOTE: Remember that when you change your CONFIG.SYS file, you must restart DOS to enable the new settings.

An Example of Changing Character Sets

If you live in Quebec, Canada, you would follow these steps to use the French-Canadian character set with your system:

1. First, add the following line to your CONFIG.SYS file:

```
COUNTRY=002
```

2. Restart MS-DOS so that MS-DOS will read your revised CONFIG.SYS file.
3. Type the NLSFUNC command to load the country-specific information found in the COUNTRY.SYS file on your system:

```
NLSFUNC
```

NOTE: If you forget to type the NLSFUNC command, MS-DOS will not allow you to specify code pages or keyboard codes.

4. MS-DOS automatically selects the French-Canadian code page for you to use. Because your country code is 002, MS-DOS has also prepared the Multilingual code page for your system. If you would like to change the system code page, type

```
CHCP 850
```

5. Select the French-Canadian keyboard code CF by typing the following command:

```
KEYB CF
```

NOTE: In place of steps 3, 4, and 5, you could add the following lines to your AUTOEXEC.BAT file. Then you would not have to type these commands each time you started MS-DOS.

```
NLSFUNC  
CHCP 850  
KEYB CF
```

Now your PC is set up to use the French-Canadian character set. Since your console screen and printer are independent devices, you also need to set them up for national language support. The next subsection explains how to do this.

How to Set Device Code Pages

MS-DOS 3.3 lets you define code pages for screen and parallel printer devices that support code page switching. Unless you want to use the United States code page 437, you will want to set up your screen and printer to use the same code page as the rest of your system.

To set up your console screen device (CON) to use code pages, use the CONFIG.SYS DEVICE command to load the DISPLAY.SYS device driver.

Example

You are using an EGA display, and want to use the Multilingual code page 850. You could include this command in your CONFIG.SYS file:

```
DEVICE=DISPLAY.SYS CON=(ega,850,2)
```

The last option, 2, allows you to prepare up to two code pages for this device. This is useful if you want to switch between code pages.

NOTE: Remember to restart MS-DOS to initiate the changes you have made to the CONFIG.SYS file.

Setting Parallel Printer Code Pages

If you have a parallel printer connected to your PC, you will want to prepare the same code pages for your printer as for the rest of your system. To do this, use the CONFIG.SYS DEVICE command again to load the installable device driver called PRINTER.SYS.

Example

If you have an IBM Proprinter, Model 4201, connected to LPT1, include the following line in your CONFIG.SYS file:

```
DEVICE=PRINTER.SYS lpt1=(4201,850,2)
```

This command line assumes that the PRINTER.SYS file is on the same disk as your CONFIG.SYS file. The last variable, 2, lets you prepare up to two code pages for this printer.

NOTE: There is no limit to the number of times you can use the DEVICE command in your CONFIG.SYS file.

How to Switch Between Code Pages

If you work in an environment that works with more than one language, you may need to switch between code pages. For example, suppose you work for an international company with offices in New York, London, Stockholm, and Oslo. You may need to use two or three different code pages to read or work from the correspondence you receive from your other offices.

For example, if you want to change to Nordic code page 865 to work with some information you receive from the Oslo office, follow these steps:

1. Be sure you have typed the NLSFUNC command. You only need to type this command once in order to load the country-specific information from the COUNTRY.SYS file.

2. Prepare the code pages for each device you intend to use. For example, type the following command to prepare code page 865 for the parallel printer connected to LPT2:

```
MODE LPT2 CODEPAGE PREPARE=865
```

MS-DOS displays the following message to let you know the code page was prepared for your device:

MODE Prepare Codepage function completed

3. To prepare code page 865 for your console screen device (CON), type the following command:

```
MODE CON CODEPAGE PREPARE=865
```

4. Next, change the code page for the system and all prepared devices by typing the following:

```
CHCP 865
```

Your screen may flicker slightly as MS-DOS loads a new code page for that device.

5. If for some reason you want to load a different code page for a single prepared device, use the select keyword with the mode command. For example, to load code page 850 for your printer, type this command:

```
MODE LPT2 CODEPAGE SELECT=865
```

MS-DOS displays the following message to let you know the code page was prepared for your device:

MODE Select Codepage function completed

NOTE: If you want to use these commands on a regular basis, you can include these command lines in your AUTOEXEC.BAT file.

How to List Current Code Pages

You can list the current prepared and selected code pages for your console screen or a parallel printer by using the mode command in the following form:

```
MODE DEVICE CODEPAGE
```

For example, to display the current code pages for your console screen device, type the following:

```
MODE CON CODEPAGE
```

MS-DOS displays a message similar to this one:

```
Active codepage for device CON is 437
hardware codepages:
Codepage 850
prepared codepages:
Codepage 437
Codepage 850
Codepage not prepared
codepage not prepared
MODE Status Codepage function completed
```

How to Refresh Lost Code Pages

It is possible for prepared code pages to be lost due to hardware errors or other reasons. For example, if you prepared code pages for your printer, and then turned off the printer, the current code page may be lost. You can use the refresh keyword with the mode command to restore the lost code page.

To illustrate, if you had selected code page 850 as the active code page for your console screen (CON), but because of a hardware error, the active code page was lost, type the following commands to reinstate the active code pages for your screen:

```
MODE CON CODEPAGE PREPARE=((850) EGA.CPI)
```

```
MODE CON REFRESH
```

USING THE SELECT COMMAND

How to Format a Disk with Country-Specific Information

MS-DOS 3.3 includes a special command, SELECT, that:

- Formats a disk
- Creates a CONFIG.SYS file and AUTOEXEC.BAT files with country-specific information
- Copies the contents of the source disk to the target disk.

WARNING

Do not use the SELECT command with a disk that already contains data files, unless you have backed up the files. Any data on the disk is destroyed when the disk is formatted by either the SELECT command or the format command.

Using Code Pages

Example After configuring your hard disk with FDISK you want to format your hard disk C. You also want to include the Latin American code page and KEYBoard code on your hard disk. After placing your MS-DOS master diskette in drive A, type the following:

```
SELECT A: C: 003 LA
```

After formatting the disk in drive C, SELECT creates two files on the target disk: AUTOEXEC.BAT and CONFIG.SYS. The contents of the AUTOEXEC.BAT file looks similiar to this:

```
PATH C:;  
KEYB LA 437  
ECHO OFF  
CLS  
DATE  
TIME  
VER
```

The contents of the CONFIG.SYS file looks similar to the following:

```
COUNTRY=003, 437
```

Finally, the SELECT command copies the MS-DOS files to the disk on drive C. If AUTOEXEC.BAT and CONFIG.SYS files exist on drive A, SELECT does not copy them to drive C.

Appendix E

SPEEDING UP YOUR HARD DISK WITH SMARTDrive

In this appendix:	See page
Using SMARTDrive.....	E-2
Types of Memory.....	E-3
Determining Which Type of Memory to Use.....	E-3
How SMARTDrive Works.....	E-4
SMARTDrive and Other Disk Programs.....	E-4
Setting Up SMARTDrive.....	E-4
SMARTDrive Messages.....	E-4

SMARTDrive (or more precisely, SMARTDRV.SYS) is a disk caching program for PCs that have a hard disk and expanded or extended memory. Disk caching programs are designed to reduce the amount of time your PC spends reading data from your hard disk.

SMARTDrive is ideal for users who work with many applications and files at once. It is especially useful when running multiple standard applications that require swapping (copying applications to and from the hard disk to make room for all applications in memory). Although SMARTDrive can be used in conjunction with applications that use expanded or extended memory, it should not be used with other memory disk or disk caching programs.

This appendix describes the following:

- What you need to use SMARTDrive, and how it works
- How to set up and use SMARTDrive
- The messages you may see from SMARTDrive.

USING SMARTDrive

To use SMARTDrive with your PC, you need the following:

- An IBM PC XT, IBM PC AT, or compatible PC with a hard disk
- An expanded memory board or an extended memory board.

Types of Memory

Expanded memory is memory beyond 640 KB that uses page-switching technology (such as INTEL Above Board and AST RAMPAGE) and that can be used in most PCs.

Installation of the expanded memory board and a special program called the Expanded Memory Manager (EMM) provide access to the additional memory.

Extended memory is memory beyond 1 MB on PC AT or compatible systems. This memory is generally not accessible to MS-DOS-based programs but can be used by memory disk programs such as VDISK or RAMDRIVE. Extended memory boards such as the AST RAMPAGE AT or INTEL Above Board/AT can be set up for either expanded or extended memory (or both) if the correct software is installed.

Determining Which Type of Memory to Use

SMARTDrive works best with expanded memory, but also provides good results with extended memory. To determine which type of memory to use with SMARTDrive, follow these rules:

- If you have only expanded memory, use expanded.
- If you have only extended memory, use extended.
- If you have a memory card that can be set up as expanded or extended memory, set it up as expanded.
- If you have both expanded and extended memory cards, use expanded memory for SMARTDrive.

When using expanded memory, follow the instructions provided by your memory board manufacturer for installing the EMM. It is recommended that you set up your memory board to provide the maximum amount of space for expanded memory.

HOW SMARTDrive WORKS

SMARTDrive reduces the amount of time it takes for applications to read information from your hard disk. To do this, SMARTDrive saves information read from or written to your hard disk in your PC's memory. SMARTDrive then supplies this information directly from memory when an application makes a request to read the information from your hard disk, a relatively time-consuming process. SMARTDrive always copies new or modified information to the hard disk as well as to expanded or extended memory, so there is no danger of losing information when you turn off your PC.

SMARTDrive AND OTHER DISK PROGRAMS

If you are already using a memory disk or disk caching program, you must modify your CONFIG.SYS file to remove any command lines associated with those programs.

SETTING UP SMARTDrive

Refer to Appendix B for information on how to set up your system to use SMARTDrive.

SMARTDrive MESSAGES

The following messages may appear when you start the SMARTDrive program. Most messages indicate some problem that needs correction before SMARTDrive can be installed and operate properly. Messages are listed in alphabetical order.

Bad or missing d:path SMARTDRV.SYS

The drive letter (d:) or the pathname (path) is incorrect. The SMARTDRV.SYS file is not in the drive or directory shown in the SMARTDrive command line.

Edit your CONFIG.SYS file and type the correct drive and pathname in the SMARTDrive line.

Microsoft SMARTDrive RAM Cache Version x.xx

Cache Size:yyyyK in Expanded Memory

This SMARTDrive message appears when DOS sets up SMARTDrive (x.xx is the version of SMARTDrive and yyyy is the amount of memory in kilobytes that SMARTDrive was able to obtain.

SMARTDrive: Expanded Memory Manager Not Present

You included the /a switch in the SMARTDrive command line but SMARTDrive could not find the expanded memory manager. Your system boot disk did not install the expanded memory manager. Your CONFIG.SYS file did not contain the appropriate information.

Consult the documentation for your expanded memory hardware for correct installation instructions.

SMARTDrive: Expanded Memory Manager Status Shows Error

While trying to set up SMARTDrive in expanded memory, MS-DOS detected an error. MS-DOS will not install the SMARTDrive program.

Run your expanded memory diagnostics to check your expanded memory. Take the appropriate corrective action as instructed in your expanded memory documentation.

SMARTDrive: Computer Must be PC-AT, or PC-AT Compatible

You do not have extended memory because you do not have an IBM PC AT or PC AT-compatible computer. MS-DOS will not install the SMARTDrive program.

If you have expanded memory, use /a on the SMARTDrive command line. If you have neither extended or expanded memory, you cannot use SMARTDrive.

SMARTDrive: Incorrect DOS Version

SMARTDrive runs only on 2.x and 3.x versions of MS-DOS. MS-DOS will not install the SMARTDrive program. Switch to a later version of MS-DOS.

SMARTDrive: Insufficient Memory

Your system has insufficient memory available for SMARTDrive. MS-DOS will not install the SMARTDrive program.

If you want to use the SMARTDrive program, you must add memory to your system.

SMARTDrive: Invalid Parameter

The command line contains too many parts, such as more than one number or more than one pathname.

The size number is out of the range of permitted numbers. Edit your CONFIG.SYS file and change the incorrect SMARTDrive line.

SMARTDrive: I/O Error Accessing Drive Memory

MS-DOS detected an error while trying to set up SMARTDrive.

Run memory tests to check the memory where SMARTDrive is set up.

SMARTDrive: No Extended Memory Available

Your system has no memory available for SMARTDrive.

If you want to use the SMARTDrive program, you must add memory to your system.

SMARTDrive: No Hard Drives in System

Your system has no hard disk. SMARTDrive works only with hard disks.

If you want to use the SMARTDrive program, you must add a hard disk to your system.

SMARTDrive: Too Many Bytes Per Track on Hard Drive

Your system has a hard disk that SMARTDrive is not compatible with.

You cannot use SMARTDrive on your system.

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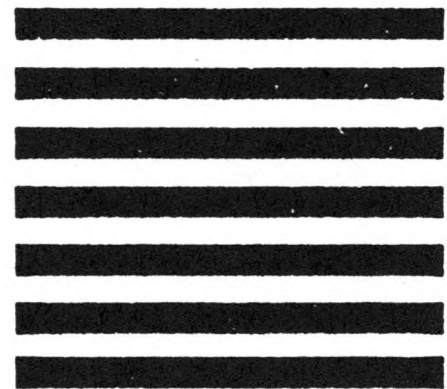
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